WORLD CONGRESS ON OSTEOPOROSIS, OSTEOARTHRITIS AND MUSCULOSKELETAL DISEASES

WCO IOF-ESCEO

2025 ROME

AbstractBook

April 10-13, 2025

Roma Convention Center
La Nuvola **Rome | Italy**

WORLD'S LEADING CLINICAL CONFERENCE
ON BONE, JOINT AND MUSCLE HEALTH

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The Abstracts will be also published, at the end of Q3 2025, in a supplement of the Journal Aging Clinical and Experimental Research, the official ESCEO Journal – IF 2023: 3.4

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ABOUT ESCEO

The European Society for Clinical and Economic Aspects of Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (ESCEO) is a not-for-profit organization, dedicated to a close interaction between clinical scientists dealing with bone, joint and muscle disorder, pharmaceutical industry developing new compounds in this field, regulators responsible for the registration of such drugs and health policy makers, to integrate the management of Osteoporosis and Osteoarthritis within the comprehensive perspective of health resources utilization.

The objective of ESCEO is to provide practitioners with the latest clinical and economic information, allowing them to organize their daily practice, in an evidence-based medicine perspective, with a cost-conscious perception.

www.esceo.org

ABOUT IOF

The International Osteoporosis Foundation (IOF) is a non-profit, non-governmental organization dedicated to the worldwide fight against osteoporosis, the disease known as "the silent epidemic". IOF's members – committees of scientific researchers, patient, medical and research societies and industry representatives from around the world – share a common vision of a world without osteoporotic fractures. IOF now represents 343 societies in 152 locations around the world.

www.osteoporosis.foundation

Mission

- Increase awareness and understanding of osteoporosis.
- Motivate people to take action to prevent, diagnose and treat osteoporosis.
- Support national osteoporosis societies in order to maximize their effectiveness

DEAR COLLEAGUES,

It is with great pleasure that we welcome you the 2025 IOF-ESCEO World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases in Rome.

The Congress' scientific programme has been developed by a team comprising members of the Committee of Scientific Advisors of the International Osteoporosis Foundation (IOF) and the Scientific Advisory Board of the European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO). We would like to thank the respective Scientific Chairs, Professors Nicholas C. Harvey, Eugene McCloskey and René Rizzoli, for taking the lead in setting up an exciting and comprehensive programme that brings together the world's best in the field of musculoskeletal health and disease and takes advantage of the synergies and combined expertise of our two organisations.

We are all meeting with a common aim - to gather new knowledge, skills and tools in the prevention and treatment of osteoporosis and osteoarthritis, the two most disabling conditions in elderly people. An important addition is a focus on sarcopenia because of its intimate relation to bone and joint disease. It is our hope that this Congress will move the field one step forward on all fronts - from new understanding of bone metabolism and pathology to new strategies and options in prevention, diagnosis and treatment.

The core scientific programme consists of **10** plenary lectures by renowned speakers and **40** oral communications selected from the very best of hundreds of submitted abstracts, and **20** oral presentations of selected posters. In addition, participants can choose among **12** different Meet-The-Expert sessions and a large number special sessions and symposia on issues of clinical importance. We also encourage you to visit many of the scheduled poster sessions and industry sponsored satellite symposia and to visit the large commercial exhibition presented by the leading companies in the bone field. Visit also the 'CNS village' where you can meet some of IOF's member societies.

The past few years has been a difficult time for scientific communication. Our World Congresses have weathered the storm of Covid-19 and successfully rebounded to the face-to-face format of previous times. Indeed, each year we break new records for attendance and abstract submissions. We are especially thankful for your continued support and participation. We will do our best to ensure that this meeting is a memorable, enriching experience for all. Welcome to Rome, a great world city far more than just the capital of Italy. Rome is bustling, vibrant, multicultural and cosmopolitan. We look forward to meeting in person with the undoubted advantages of direct rather than virtual contact.

John A. Kanis
IOF Honorary President

Jean-Yves Reginster
ESCEO President

EVENT

WCO-IOF-ESCEO
April 10-13, 2025

World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases

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PRECCO

PRE-COMPETITIVE CONSORTIUM ON OSTEOPOROSIS AND BONE HEALTH

An initiative from ESCEO and IOF to support the five-year partnership signed between ESCEO and the World Health Organization to improve the management of osteoporosis

ESCEO and IOF are very proud to announce the creation of the Pre-Competitive Consortium on Osteoporosis and Bone Health (PRECCO). This Consortium, created to support the five-year partnership signed between ESCEO and the **World Health Organization** to improve the management of osteoporosis, involves a diverse range of stakeholders, who place the osteoporotic patients at the center of their priorities, independently of their immediate strategy, in terms of content and timeline. The stakeholders supporting the PRECCO are listed below.

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13:00 - 16:00 - Auditorium A

SYMPOSIUM: OSTEOPOROSIS & CHRONIC KIDNEY DISEASES – METABOLIC BONE DISEASES UNDER THE SAME UMBRELLA

Chairpersons: David Dempster, Nicholas C. Harvey

13:00 **Introduction - Osteoporosis vs Renal Osteodystrophy**
Pieter Evenepoel

13:20 **Bone Histology - Osteoporosis vs Renal Osteodystrophy**
David Dempster

13:40 **Diagnosis: Biochemistry, Imaging - Osteoporosis vs Renal Osteodystrophy**
Thomas L. Nickolas

14:00 **Discussion**

14:20 **Courtesy Break**

14:40 **Vascular Calcification in Chronic Kidney Diseases - Metabolic Bone Diseases & associated Osteoporosis**
Ziad Massy

15:00 **Current Therapeutic Options - Osteoporosis & Renal Osteodystrophy**
Sandro Mazzaferro

15:20 **Intermittent PTH Administration in the Management of Chronic Kidney Diseases - Metabolic Bone Diseases**
Michael Pazianas

15:40 **Discussion**

16:30 - 19:10 - Auditorium A

WCO-IOF-ESCEO - OPENING CEREMONY

Chairpersons: René Rizzoli, Nicholas C. Harvey

16:30 **Best clinical papers published in 2024**
René Rizzoli

17:10 **Opening of the congress**
René Rizzoli, Nicholas C. Harvey

17:15 **Two years of partnership between WHO and ESCEO: Achievements and perspectives**
Doctor Jotheeswaran Amuthavalli Thiyagarajan (WHO-Geneva)

17:25 **Presentation of the Islene Araujo de Carvalho-ESCEO 2025 Prize**
Doctor Jotheeswaran Amuthavalli Thiyagarajan (WHO-Geneva), Jean-Yves Reginster

17:30 **Partnering for Progress: Global Drug Development and Scientific Societies**
Bruno Sepodes

17:40 **Presentation of the ESCEO-IOF Pierre Delmas Medal**
Jean-Yves Reginster

17:45 **Revival of the European Medicines Agency activities oriented towards older people**
Francesca Cerreta

17:55 **Presentation of the IOF President›s Award**
Nicholas C. Harvey

18:00 **New Perspectives in the management of patients with osteoporosis**
Willard Dere

18:30 **Presentation of the 2025 ESCEO Medal of Excellence**
René Rizzoli

18:35 **Highlights of the Galleria Borghese**
Francesca Cappelletti

19:05 **Closure of the Opening Ceremony Session and Opening of the Cocktail**
Jean-Yves Reginster

19:10 - 20:10

SPONSORED WELCOME COCKTAIL

See details on the Sponsored Sessions Section

08:00
OPENING OF THE CONGRESS & COMMERCIAL EXHIBITION

08:00 - 09:00 - Auditorium B
SPONSORED BREAKFAST SYMPOSIUM
See details on the Sponsored Sessions Section

08:00 - 09:00
NON-SPONSORED SYMPOSIA

MR1 **Management of osteoporotic vertebral fractures - Risk factor - Guidelines - Technology**
Chairpersons: Andreas Kurth, Chistopher Niedhardt
- Risk factor vertebral fractures Peyman Hadji
- German Guidelines for the Treatment of vertebral osteoporotic fractures Andreas Kurth
- 30 Years of Vertebro- and Kyphoplasty Robert Pflugmacher

MR2 **Update in Low Back Pain: Diagnosis, Guidelines and Management**
Chairpersons: Fitnat Dincer, Andreas Winkelmann
- Approach of physiatrists to Low Back Pain in Europe, results of a research and WHO guideline Fitnat Dincer
- Update in Diagnosis and Management of Low Back Pain Andreas Winkelmann

MR3 **Empowering Patients: Integrating Preferences and Perspectives into Osteoporosis Care and Policy Development**
Chairperson: Angie Botto-van Bemden
- What Do We Know About Preferences of Patients at Risk for Fractures? Lakshmi Nagendra
- Integrating Patients Preferences and Perspectives into Osteoporosis Care and Policy Development: An Academic Perspective Mickael Hiligsmann
- Integrating Patient Preferences and Perspectives into Osteoporosis Care and Policy Development: The Patient Perspective Angie Botto-van Bemden

MR4 **Muscle And Bone: A Multifaceted Connection**
Chairperson: Osvaldo Daniel Messina
- A message from the bone: how bone-secreted factors affect muscle growth and function Gustavo Duque
- The role of fat in muscle/bone crosstalk: an additional complex player Tiffany Kim
- A message from the muscle: how muscle-secreted factors affect bone metabolism and function Osvaldo Daniel Messina

MR6 **Optimization of bone health in orthopaedic surgical patients**
Chairperson: P. Dean Cummings
- Underlying Bone Health: Is it Important to Surgical Outcomes? P. Dean Cummings
- Orthopaedic Surgeries Affected by Compromised Bone Health Nikos Koumontzis
- Development of Pre- and Post-operative Bone Health Programs for Orthopedic Surgical Patients Isabella Esposito

MR7 **Hyponatremia and Bone**
Chairpersons: Maria Luisa Brandi, Alessandro Peri
- What did basic research tell us? Alessandro Peri
- Hyponatremia and bone density Laura Potasso
- Hyponatremia, falls and fractures Ploutarchos Tzoulis
- Discussion and Conclusion

MR8 **Discovery, validation and implementation of endophenotyping for patient stratification in osteoarthritis clinical trials**
Chairperson: Ali Mobasheri
- Advancing osteoarthritis trials and therapeutic development through clinical phenotyping and molecular endotyping Ali Mobasheri
- Endotyping osteoarthritis by interrogating the pathobiological bioactivity present in osteoarthritic synovial fluid Tim J. M. Welting
- Insights into OA endophenotypes from recent clinical trials Philip Conaghan
- Obesity shapes the inflammatory molecular endotypes of synovial fibroblasts in osteoarthritis Simon W. Jones
- Clinical application of longitudinally stable molecular endotypes in osteoarthritis: pathways to precision medicine Anne-Christine Bay-Jensen

MR10 **The skeleton in the Closet: A historical look at osteoporosis**
Chairperson: Bruno Muzzi Camargos
- Osteoporosis in Ancient History
  Geraldine Altamar
- Osteoporosis in Art Andres Coy
- History of Osteoporosis pharmacological treatment Michael McClung

08:00 - 09:00 - MR5
ESCEO SYMPOSIUM
Recommendations for an optimal use of Bone Forming Agents in osteoporosis
Chairpersons: Bernard Cortet, Nicola Veronese
- Which patients should benefit from a Bone Forming Agent? Elizabeth M. Curtis
- Comparative efficacy and safety of currently available Bone Forming Agents René Rizzoli
- Discussion Leader Peter R. Ebeling

09:00 - 10:30 - Auditorium A
SCIENTIFIC SESSION I
Chairpersons: Elaine M. Dennison, Salvatore Minisola

09:00 **Plenary Lecture**
Hormone therapy for fracture prevention - a sex stratified approach Michael McClung

09:30 **ORAL COMMUNICATIONS SELECTED FROM ABSTRACTS**

09:30 **OC1** AGA2118, A BISPECIFIC MONOCLONAL ANTIBODY NEUTRALIZING BOTH SCLEROSTIN AND DKK1, INCREASED BONE FORMATION, DECREASED BONE RESORPTION, AND LED TO RAPID BMD GAINS IN A FIRST IN HUMAN, SINGLE- AND MULTIPLE- DOSE, PLACEBO-CONTROLLED, RANDOMIZED STUDY
Presenting author: B. Langdahl
Authors: M. T. Drake, Y. L. Zhang, J. Z. Ke, Y. F. Li, M. Lankachandra, A. C. Zovein, H. Z. Ke, W. H. Dere & R. E. Dent

09:40 **OC2** WEEKLY VITAMIN D AND DAILY CALCIUM CARBONATE OVER 48-WEEKS INCREASES BONE DENSITY IN ADOLESCENTS WITH HIV AND 25(OH)D <75NMOL/L: A PLACEBO-CONTROLLED TRIAL IN SOUTHERN AFRICA
Presenting author: C. Gregson
Authors: T. Madanhire, N. V. Dzavakwa, L. Kasonka, H. Banda-Mabuda, T. Bandason, M. Chisenga, S. Filteau, K. Kranzer, H. Mujuru, U. E. Schaible, S. L. Rowland-Jones, V. Simms & R. A. Ferrand

09:50 **OC3** PTH1 RECEPTOR AGONISTS FOR FRACTURE RISK: A SYSTEMATIC REVIEW AND NETWORK META-ANALYSIS
Presenting author: C. Beaudart
Authors: N. Veronese, J. Douxfils, J. Amuthavalli Thiyagarajan, F. Bolzetta, P. Albanese, G. Voltan, M. Alokail, N. C. Harvey, N. R. Fuggle, R. Rizzoli & J.-Y. Reginster

10:00 **OC4** EFFECTS OF EB613 TABLETS [ORAL PTH(1-34)] ON TRABECULAR AND CORTICAL BONE USING 3D-DXA: POST-HOC RESULTS FROM PHASE 2 STUDY
Presenting author: R. Wagman
Authors: G. Burshtein, C. Itin, H. Galitzer, M. Kushnir, M. Toledano, L. Humbert, R. Boyce, S. L. Ferrari & F. Cosman

10:10 **OC5** SUSTAINED REDUCTION IN FRACTURE RATE IN PATIENTS WITH OI TREATED WITH SETRUSUMAB: FOURTEEN MONTH DATA FROM PHASE 2 OF THE PHASE 2/3 ORBIT STUDY
Presenting author: J. Nowicki
Authors: S. Gottesman, O. Carpenter, D. Velasco, M. Wallace, P. Smith, A. Imel, D. Luca, M. Byers, S. Krolczyk & E. M. Lewiecki

10:20 **OC6** PROGRESSIVE DECREASES IN FRACTURE INCIDENCE WITH ZOLEDRONATE USE >3 YEARS
Presenting author: I. Reid
Authors: A. M. Horne, B. Mihov & G. D. Gamble

10:30 - 12:10 - Auditorium A
SCIENTIFIC SESSION II
Chairpersons: Jean-Marc Kaufman, Maria Luisa Brandi

10:30 **Presentation of the 2025 IOF CSA Medal of Achievement**
Eugene McCloskey

10:40 **Plenary Lecture**
Anti-resorptives: series or parallel ?
Eugene McCloskey

11:10 **ORAL COMMUNICATIONS SELECTED FROM ABSTRACTS**

11:10 **OC7** COMPREHENSIVE COMPARATIVE ANALYSIS OF INFRAPATELLAR FAT PAD MORPHOLOGIES IN A LONGITUDINAL KNEE OSTEOARTHRITIS STUDY: NEW INSIGHTS INTO ITS ROLE AS A PROGNOSTIC MARKER
Presenting author: J.-P. Pelletier
Authors: P. Paiement, F. Abram, M. Dorais, J.-P. Raynauld & J. Martel-Pelletier

11:20 **OC8** RESULTS FROM A RANDOMISED CONTROLLED PHASE II TRIAL WITH LEVI-04, A NOVEL NEUROTROPHIN-3 INHIBITOR, DEMONSTRATE SUBSTANTIALLY IMPROVED PAIN AND FUNCTION WITHOUT DELETERIOUS EFFECTS ON JOINT STRUCTURE IN PEOPLE WITH KNEE OSTEOARTHRITIS
Presenting author: P. Conaghan
Authors: A. Guermazi, N. Katz, A. Bihlet, R. Dror, M. Perkins, B. Hughes, C. Herholdt, I. Bombelka & S. Westbrook

11:30 **OC9** A PHASE 1B RANDOMIZED CONTROLLED TRIAL EVALUATING SAFETY AND PHARMACODYNAMICS OF A NOVEL IL-1RA GENE THERAPY (GNSC-001) INJECTION IN KNEE OA: 6-MONTH INTERIM RESULTS
Presenting author: J. Tambiah
Authors: S. Jackson, M. Concepcion, S. Vijay, T. W. Chalberg, A. Annahita & P. G. Conaghan

11:40 **OC10** EFFECTIVENESS OF CELECOXIB IN REDUCING OSTEOARTHRITIS (OA) PAIN IN PATIENTS WITH MODERATE AND SEVERE PAIN: ONCE-DAILY VS TWICE-DAILY DOSING
Presenting author: E. Choy
Authors: C. Walker, R. Chiaese, E. Biesheuvel & S. Suresh Kumbhar

11:50 **OC11** 10-YEAR FOLLOW-UP AFTER INTRA-ARTICULAR INJECTIONS OF 2.5 % POLYACRYLAMIDE HYDROGEL FOR KNEE OSTEOARTHRITIS
Presenting author: H. Bliddal
Authors: A. Hartkopp, P. Conaghan & M. Henriksen

12:00 **OC12** EFFECTS OF INTRA-ARTICULAR HYALURONIC ACID INJECTIONS ON PAIN AND FUNCTION IN KNEE OSTEOARTHRITIS PATIENTS: AN UMBRELLA REVIEW OF SYSTEMATIC REVIEWS AND META-ANALYSES OF RANDOMIZED PLACEBO-CONTROLLED TRIALS
Presenting author: O. Bruyère
Authors: M. Alokail, N. Al-Daghri, J.-Y. Reginster & S. Sabico

12:15 - 13:45 - Auditorium A
SPONSORED LUNCH SYMPOSIUM
See details on the Sponsored Sessions Section

12:15 - 13:45 - Auditorium B
SPONSORED LUNCH SYMPOSIUM
See details on the Sponsored Sessions Section

14:00 - 15:00 - Podium
ORAL PRESENTATIONS OF SELECTED POSTERS
Chairperson: Fanny Buckinx

14:00 **OP1 - P815** OBESITY IS RELATED TO POORER FUNCTIONAL OUTCOMES AMONG INDIVIDUALS WITH RADIOGRAPHIC KNEE OSTEOARTHRITIS: FINDINGS FROM THE HERTFORDSHIRE COHORT STUDY
Presenting author: L.D. Westbury
Authors: F. Laskou, F. Kirkham-Wilson, G. Bevilacqua, N. R. Fuggle & E. M. Dennison

14:06 **OP2 - P700** DRIVING KNEE OSTEOARTHRITIS STRUCTURAL PROGRESSOR PROGNOSIS INTO THE NEXT GENERATION: LEVERAGING MACHINE/DEEP LEARNING, MICRORNA AND MAGNETIC RESONANCE IMAGING
Presenting author: J. Martel-Pelletier
Authors: A. Jamshidi, O. Espin-Garcia, T. G. Wilson, I. Loveless, J.-P. Pellletier & S. A. Ali

14:12 **OP3 - P686** EFFECTIVENESS OF PRESCRIPTION GLUCOSAMINE SULFATE (PGS) IN A COHORT OF FILIPINO PATIENTS WITH MILD-MODERATE KNEE OSTEOARTHRITIS (OA)
Presenting author: J.J. Lichauco
Authors: C. Walker, R. Chiaese, H. Scott & S. Venugopal

14:18 **OP4 - P1138** SAFETY OF ANTI-OSTEOARTHRITIS MEDICATIONS: OUTCOMES OF A SYSTEMATIC LITERATURE REVIEW OF POST-MARKETING SURVEILLANCE STUDIES
Presenting author: O. Bruyère
Authors: G. Honvo, L. Lengelé, M. Alokail, N. Al-Daghri, J.-Y. Reginster

14:24 **OP5 - P553** EFFECT OF TIBOLONE ON CORTICAL AND TRABECULAR BONE IN POSTMENOPAUSAL WOMEN COMPARED WITH ESTROGEN THERAPY
Presenting author: G.A. Cruz Priego
Authors: P. Clark, M.-A. Guagnelli, L. Humbert, S. Ortiz-Santiago, L. Castrejón-Delgado & M. A. Sánchez-Rodriguez

14:30 **OP6 - P817** VERTEBRAL FRACTURES IDENTIFIED ON LATERAL DXA IMAGES USING DEEP NEURAL NETWORKS PREDICT INCIDENT FRACTURES IN OLDER WOMEN
Presenting author: L. Johansson
Authors: V. Wåhlstrand, J. Alvén, I. Häggström & M. Lorentzon

14:36 **OP7 - P381** MACHINE LEARNING FOR THE PREDICTION OF FRAGILITY FRACTURES BY BONE AND BODY COMPOSITION PARAMETERS: FINDINGS FROM THE OSTEOLAUS 10 YEARS POPULATIONAL COHORT
Presenting author: C. Vendrami
Authors: G. Gatineau, E. Gonzalez Rodriguez, O. Lamy, D. Hans & E. Shevroja

14:42 **OP8 - P485** REMS TECHNOLOGY FOR FRACTURE RISK ASSESSMENT IN KIDNEY TRANSPLANT PATIENTS
Presenting author: F.A. Lombardi
Authors: P. Pisani, F. Conversano, C. Stomaci, F. R. Contaldo, E. Casciaro, G. Peluso, A. C. Stetco, R. Franchini, M. Di Paola & S. Casciaro

14:48 **OP9 - P940** IMPACT OF AI-ENABLED VERTEBRAL FRACTURE (VF) IDENTIFICATION ON FRACTURE LIAISON SERVICE (FLS) KEY PERFORMANCE INDICATORS (KPIS) AND TREATMENT RECOMMENDATIONS VARIES BY FLS
Presenting author: K. Javaid
Authors: F. A. A. Clemeno, D. Chappell, J. Connor, J. Threlkeld, C. Chisholm, K. E. S. Poole, J. Boylan, J. Turton, M. Stone, C. Toogood, T. Santos, M. Sampson, M. Baxter, E. Curtis, R. Eckert, O. Sahota, Y. Kimmel & R. Pinedo-Villanueva

14:54 **OP10 - P724** TRENDS IN HIP FRACTURE INCIDENCE IN ENGLAND BEFORE, DURING, AND AFTER THE COVID-19 PANDEMIC (2014-2023)
Presenting author: J. Webster
Author: R. Goldacre

14:00 - 15:00
POSTER VIEWING SESSION I

14:00 - 15:00
MEET-THE-EXPERT SESSION

MR1 **Influences of parental health on the next generation bone**
Elizabeth M. Curtis, Rebecca Moon

MR2 **Paget's disease of bone: management lessons from pivotal studies**
Elaine M. Dennison

MR3 **Fracture risk in cancer survivors: bone fragility beyond metastases**
Cyrille Confavreux

MR4 **Advances in management of osteogenesis imperfecta**
Maria Luisa Brandi

14:00 - 15:00 - MR5
SPONSORED SESSION
See details on the Sponsored Sessions Section

14:00 - 15:00 - MR8
EDUCATIONAL LECTURE
Lessons from interventional studies conducted in sarcopenia: are we close to a treatment?
Francesco Landi

14:00 - 15:00 - MR6
ESCEO SYMPOSIUM
Impact of central nervous system dysfunctions (Dementia and Mild Cognitive Impairment) on bone health in older people
Chairpersons: René Rizzoli, Andrea Ticinesi
- Relation between cognitive impairment and bone health Mario Miguel Coelho Da Silva Rosa
- Drugs used in cognitive impairment and bone health Ewa Balkowiec-Iskra
- Discussion leader Maria Concepcion Prieto Yerro

14:00 - 15:00 - MR7
ESCEO-IOF-IFCC SYMPOSIUM
Update on the role of Bone Turnover Markers in the diagnosis and management of osteoporosis
Chairpersons: Andrea Laslop, Etienne Cavalier
- Why and how should we test biochemical markers of bone turnover in 2025?
  Harjit Pal Bhattoa
- What do bone turnover markers bring to the clinician, in the screening, diagnosis and monitoring of osteoporosis in 2025?
  Stuart L. Silverman
- What is the role of bone turnover markers in Chronic Kidney Disease-related osteoporosis?
  Mathias Loberg Haarhaus
- Discussion leader Etienne Cavalier

15:00 - 17:00 - Auditorium A
SCIENTIFIC SESSION III
Chairpersons: Bess Dawson-Hughes, Leith Zakraoui

15:00 **Plenary Lecture**
Osteoanabolics: to lump or to split?
Jean-Yves Reginster

15:30 **ORAL COMMUNICATIONS SELECTED FROM ABSTRACTS**

15:30 **OC13** ASSESSING BONE MINERAL DENSITY: A COMPARATIVE STUDY OF DXA AND RADIOFREQUENCY ECHOGRAPHIC MULTI-SPECTROMETRY (REMS) IN ASIAN POPULATION
Presenting author: Y. Yoshino
Authors: Y. Asada, E. Tomatsu, S. Sekiguchi-Ueda, S. Shibata, T. Takayanagi, Y. Seino, Y. Sasaki, H. Takai, H. Ito, H. Sasaki & A. Suzuki

15:40 **OC14** RAPID BONE MICROARCHITECTURE DECLINE, BUT NOT HIGHER FRACTURE RISK, IN MEN WITH ELEVATED FGF23 CONCENTRATION – THE STRAMBO STUDY
Presenting author: P. Szulc
Authors: D. Whittier, S. K. Boyd, L. C. Hofbauer & R. Chapurlat

15:50 **OC15** NUMBER OF FRACTURES AND FRACTURE INCIDENCE IN RELATION TO BONE MINERAL DENSITY: AN INTERNATIONAL META-ANALYSIS
Presenting author: H. Johansson
Authors: N. C. Harvey, E. McCloskey, E. Liu, L. Vandenput, M. Lorentzon, W. D. Leslie, J. A. Kanis & Frax Meta-Analysis Cohort Group

16:00 **OC16** TYPE I DIABETES MELLITUS IS ASSOCIATED WITH INCREASED FRACTURE RISK INDEPENDENT OF BONE MINERAL DENSITY: AN INTERNATIONAL META-ANALYSIS
Presenting author: N. C. Harvey
Authors: E. M. Curtis, H. Johansson, E. V. McCloskey, E. Liu, L. Vandenput, M. Lorentzon, W. D. Leslie, J. A. Kanis & Frax Meta-Analysis Cohort Group

16:10 **OC17** EXTERNAL VALIDATION OF AN AI-DRIVEN RADIOGRAPHIC TOOL FOR OPPORTUNISTIC DETECTION OF HIGH BONE FRAGILITY RISK IN DIVERSE INTERNATIONAL COHORTS
Presenting author: G. Gatineau
Authors: M. De Gruttola, K. Hind, M- Davies, M. Kužma, J. Payer, G. Guglielmi, A. Fahrleitner-Pammer, KJ. Chun, K. Jones, D. Krueger, N. Binkley & D. Hans

16:20 **OC18** COST-EFFECTIVENESS OF OPPORTUNISTIC OSTEOPOROSIS SCREENING USING CHEST RADIOGRAPHS WITH DEEP LEARNING IN GERMANY
Presenting author: M. Hiligsmann
Author: J.-Y. Reginster

16:30 **Plenary Lecture**
Obesity stratification in personalised osteoporosis management Peter R. Ebeling

15:00 - 16:45 - MR5

COMMITTEE OF NATIONAL SOCIETIES SPECIAL PLENARY SESSION: FRAGILITY FRACTURE MANAGEMENT – CHALLENGES AND SOLUTIONS

Chairpersons: Famida Jiwa, Şansin Tüzün

15:10 **OCs1** TARGETING THE MUSCLE–BRAIN AXIS: THE RECIPROCAL RELATIONSHIP BETWEEN COGNITIVE IMPAIRMENT AND SARCOPENIA- DOES IT REPRESENT A NEW PARADIGM IN SARCOPENIA?
Presenting author: Y. El Miedany
Authors: N. Gadallah, M. Sarhan, M. Elgaafary, W. Hassan, N. El Gharbawy, S. Moussa, S. Fathi, N. Fouda, D. El Mikkawy, O. Saboony, A. Safar, W. Elwakil, S. Mahran, M. Elkaramany, N. M. Ahmed, M. Y. Mahgoub & A. Samir

15:18 **OCs2** EVIDENCE-BASED JOINT STATEMENT POSITION OF PERIOPERATIVE BONE OPTIMIZATION IN THE ARTHROPLASTY CANDIDATE, FROM 7 NATIONAL SOCIETIES
Presenting author: R.E. Lopez Cervantes
Authors: F. Torres-Naranjo, I. Etxebarria-Foronda, C. Ojeda-Thies, F. Linares-Restrepo, M. A. González-Reyes, J. R. Caeiro-Rey & D. E. Garin-Zertuche

15:26 **OCs3** ACCURACY OF ARTIFICIAL INTELLIGENCE FOR VERTEBRAL FRACTURE ASSESSMENT BY DXA SCAN
Presenting author: O. Phruetthiphat
Authors: P. Sinlapavilawan & K. Homsapaya

15:34 **OCs4** GLP-1 RECEPTOR AGONISTS AND RISK OF BONE FRACTURES IN ELDERLY PEOPLE WITH TYPE 2 DIABETES
Presenting author: P. Rotman-Pikielny
Authors: M. Kasher Meron, T. Hornik-Lurie & G. Twig

15:42 **OCs5** SARCOPENIA AND ELECTROCARDIOGRAPHIC MARKERS OF ARRHYTHMIA RISK IN OLDER ADULTS
Presenting author: D. Seyithanoglu
Authors: O. Erdogan, T. Erdogan, Z. Fetullahoglu, D. Erbas Sacar, O. Kumet, S. Ozkok, M. A. Karan & G. Bahat

15:50 **Presentation of the IOF Committee of National Societies Medal**
Famida Jiwa, Şansin Tüzün

16:00 **OCs6** AN ARTIFICIAL INTELLIGENCE ALGORITHM TO IMPROVE DIAGNOSIS OF VERTEBRAL FRACTURES EMBEDDED IN FRACTURE LIAISON SERVICES CAN REDUCE FRACTURES AND REDUCE COSTS
Presenting author: R. Pinedo-Villanueva
Authors: G. Fabiano, F. Clemeno & M. K. Javaid

16:08 **OCs7** HIGH-DOSE VITAMIN D THERAPY (300,000 IU MONTHLY): IMPLICATIONS FOR OSTEOARTHRITIS, OSTEOPOROSIS AND ARTERIAL STIFFNESS IN VITAMIN-D DEFICIENT PATIENTS
Presenting author: S. Sokolovic
Author: I. Sokolovic-Tahtovic

16:16 **OCs8** DESTRESSING MINDS. STRENGTHENING MUSCLES. YOGA AND ITS EFFECT ON MUSCLE STRENGTH IN HEALTHY INDIVIDUALS. A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS
Presenting author: P. Bajaj
Authors: L. Nagendra, M. Samuel & M. Chandran

16:24 **OCs9** HIGH-THROUGHPUT SEQUENCING OF BONE METABOLISM GENES AND THEIR ASSOCIATION WITH OSTEOPOROSIS RISK
Presenting author: P. Marozik
Authors: A. Rudenka, V. Samokhovec, K. Kobets & E. Rudenka

16:32 **OCs10** SARCOPENIA AND BONE HEALTH PARAMETERS IN POSTMENOPAUSAL WOMEN WITH DIFFERENT TYPES OF OSTEOPOROTIC FRACTURES
Presenting author: N. Grygorieva
Authors: A. Musiienko, D. Kurylo & A. Iniushina

17:00 - 18:30 - Auditorium A
SPONSORED SATELLITE SYMPOSIUM
See details on the Sponsored Sessions Section

18:30 - 19:30
NON-SPONSORED SYMPOSIA

MR1 **Sedentary Behaviour: Understanding and measuring its importance in muscle-bone health**
Chairperson: Mylène Aubertin-Leheudre
- Assessing sedentary behaviours using the Patient Reported Outcome Measures (PROMS) Charlotte Beaudart
- The Impact of Sedentary Behaviour on Physical Capacity across lifetime Mylène Aubertin-Leheudre
- The Impact of Sedentary Behaviour Versus Physical Activity on Bone Health Olivier Bruyère

MR2 **Potential benefits of art, music and dance on bone and muscle health**
Chairpersons: Jorge Luis Alberto Morales Torres, Osvaldo Daniel Messina
- Introduction: Art, Music, Dancing and Health Osvaldo Daniel Messina
- Artists and activism Jorge Luis Alberto Morales Torres
- Potential mechanisms for Argentinian Tango and fracture reduction Kassim Javaid
- Health professionals and art: For fun only? Jorge Luis Alberto Morales Torres
- Conclusions

MR3 **Multiple sclerosis and osteoporosis**
Chairperson: Ifigenia Kostoglou-Athanassiou
- Multiple sclerosis. An autoimmune disease Ifigenia Kostoglou-Athanassiou
- Osteoporosis in the context of multiple sclerosis Lambros Athanassiou
- Treatment of osteoporosis in the context of multiple sclerosis Panagiotis Athanassiou
- Falls and prevention in multiple sclerosis Yannis Dionyssiotis

MR4 **Vertebral compression fractures: From care to augmentation**
Chairpersons: Şansin Tüzün, Ülkü Akarirmak
- The Impact of Vertebral Compression Fractures Ülkü Akarirmak
- Key Rehabilitation Principles in Vertebral Fractures Şansin Tüzün
- Bracing in Vertebral Fractures: Myths and Facts Rana Terlemez
- Vertebral Augmentation: Who and When? Çağatay Öztürk

MR6 **Not a cartilage, not a bone, osteoarthritis is a nerve-related condition**
Chairpersons: Johanne Martel-Pelletier, Jean-Pierre Pelletier

- What do we know about osteoarthritis: Does it translate between affected species? Eric Troncy
- Somatosensorial and neurological alterations in feline and canine osteoarthritis Aliénor Delsart
- Evidence-based efficacy in managing osteoarthritis in companion animals Eric Troncy

MR7 **Treatment of moving targets: from guidelines into practice**
Chairperson: Bruno Muzzi Camargos

- Guidelines addressing imminent risk strategies Andrès Felipe Coy Barrera
- Treatment discontinuation and intermittent use of bisphosphonates Geraldine Altamar
- Sequential and combination therapies mostly supported or avoided Bruno Muzzi Camargos

MR8 **Bone health in patients with prostate cancer on androgen deprivation therapy**
Chairpersons: Jean-Jacques Body, René Rizzoli

- Bone health in patients with non-metastatic prostate cancer on androgen deprivation therapy (ADT) – an Overview Nicola Napoli
- Summary of the evidence on bone agents in patients with prostate cancer on ADT Marlene Chakhtoura
- Recommendations for the management of patients with prostate cancer on ADT David Kendler

MR10 **Implementing and maintaining FLS services: (painful) Lessons learned from working with resource constraints and attempting to overcome hurdles**
Chairperson: Maria Luisa Brandi

- Opening Remarks Maria Luisa Brandi
- Lessons learned from implementing and maintaining FLS in Singapore Manju Chandran
- Lessons learned from mentorship in Switzerland Thierry Chevalley
- Navigating Challenges in the Fight For Fracture Liaison Services in South Africa Teréza Hough
- Panel Discussion and Closing Remarks

08:00 - 09:00 - Auditorium B

SPONSORED BREAKFAST SYMPOSIUM

See details on the Sponsored Sessions Section

08:00 - 09:00

NON-SPONSORED SYMPOSIA

MR1 Comprehensive Care for Pediatric Bone Fragility

Chairperson: Leith Zakraoui

- Bone fragility and osteoporosis in children and adolescents: when and how to diagnose it? Yasmine Makhlouf
- Bone fragility and osteoporosis in children and adolescents: when and how to treat it? Saoussen Miladi
- Discussion / Q&A

MR2 Osteoporosis and Complex Regional Pain Syndrome (CRPS)

Chairperson: Ayşe A. Küçükdeveci

- A significant problem following osteoporotic fractures: Complex Regional Pain Syndrome Yeşim Gökçe-Kutsal
- Can we treat CRPS by pharmacological agents? Yeşim Kirazlı
- The role of non-pharmacological approaches in the management of CRPS Ayşe A. Küçükdeveci

MR3 The evolution of post fracture care services in LATAM pre and post CTF mentorship programme

Chairpersons: Osvaldo Daniel Messina, Willem Lems

- Qualitative and quantitative change in FLS/PFC in LATAM. An overview J. Francisco Torres Naranjo
- Key Performance Indicators of PFC/FLS in LATAM. Expected outcomes based on BC in Mexico and Colombia Adriana Medina
- Successful country specific strategies to improve and increase the number of FLS Edgar Castro Osorio
- Challenges ahead. Gathering key data for monitoring performance and improving quality of PFC/FLS. Country specific dataset. Experience of the Argentine Hip Fracture Registry: Pasos® Program Maria Diehl

MR4 Patient-centred approach to Sarcopenia: from standard of care to digital technologies

Chairpersons: Maria Luisa Brandi, Giovanni Iolascon

- The global burden of Sarcopenia Francesca Gimigliano
- Multimodal exercise and nutrition: the pillars of Sarcopenia treatment Giovanni Iolascon
- Digital Technologies in Sarcopenia Treatment: the right therapy for the right patient Antimo Moretti
- Closing remarks

MR8 Pregnancy and lactation, a challenge for the Bone and Muscle Health

Chairperson: Yasser El Miedany

- Pregnancy, and lactation a challenge for the skeleton Naglaa Ali
- Movement recommendations for Pregnant and lactating women Mohamed Hassan Abu-Zaid

MR10 Abdominal aortic calcification and musculoskeletal health

Chairperson: Peter R. Ebeling

- Abdominal aortic calcification, what it is and why it is important Joshua R. Lewis
- Abdominal aortic calcification and musculoskeletal outcomes Pawel Szulc
- Abdominal aortic calcification as a novel risk factor for falls and fractures in routine clinical practice William D. Leslie
- Provision of abdominal aortic calcification results to patients John T. Schousboe

08:00 - 09:00 - MR5

ISGE-ESCEO JOINT SYMPOSIUM SESSION

The gynecologist and bone: A tale of woman›s health

Chairpersons: Andrea Riccardo Genazzani, Şansin Tüzün

- The role of sex steroids in the health of the musculoskeletal system: a lifetime journey Andrea Riccardo Genazzani
- When the ovaries fail early: protecting the bone Svetlana Vujovic
- Menopause and the bone: a matter for gynecologists Stefano Lello

08:00 - 09:00 - MR6
ESCEO SYMPOSIUM
Treatment of osteoporosis and osteoarthritis in the oldest old
Chairpersons: Andrea Laslop, René Rizzoli

- Specific considerations for the management of osteoporosis in the oldest old
  Nicholas C. Harvey
- Specific considerations for the management of osteoarthritis in the oldest old
  Philip Conaghan
- Discussion leader Carla Torre

08:00 - 09:00 - MR7
DVO-ESCEO SYMPOSIUM
Special aspects of osteoporosis
Chairpersons: Ralf Schmidmaier, Olivier Bruyère

- The role of bone anabolic treatment in the geriatric population Ralf Schmidmaier
- Management of pregnancy associated osteoporosis Peyman Hadji
- Osteonecrosis of the jaw: novel insights and current status Sven Otto, Philipp Poxleitner, Katharina Obermeier
- Dealing with atypical femur fractures
  Andreas Kurth

09:00 - 10:30 - Auditorium A
SCIENTIFIC SESSION IV
Chairpersons: Manju Chandran, Peter R. Ebeling

09:00 **Plenary Lecture**
Advances in personalized fracture risk assessment: FRAX and beyond Nicholas C. Harvey

09:30 **ORAL COMMUNICATIONS SELECTED FROM ABSTRACTS**

09:30 **OC19** RELATIONSHIP BETWEEN COMORBIDITY, PHYSICAL ACTIVITY AND FRAILTY DIFFER ACCORDING TO EDUCATIONAL ATTAINMENT: FINDINGS FROM THE SOUTHAMPTON LONGITUDINAL STUDY OF AGEING (SALSA)
Presenting author: F. Laskou
Authors: L. D. Westbury, F. Kirkham-Wilson, G. Bevilacqua, N. R. Fuggle, E. M. Dennison, P. Aggarwal & H. P. Patel

09:40 **OC20** RELATIONSHIPS BETWEEN CHANGE IN SEX HORMONES WITH CHANGE IN MEASURES OF SARCOPENIA: A LONGITUDINAL STUDY IN COMMUNITY DWELLING OLDER MEN
Presenting author: S. Hills
Authors: T. A. Mansfield, P. Cawthon, N. E. Lane & E. S. Orwoll

09:50 **OC21** OSTEOSARCOPENIA AS A RISK FACTOR FOR DEPRESSION: LONGITUDINAL FINDINGS FROM THE SHARE STUDY
Presenting author: N. Veronese
Authors: F. S. Ragusa, S. Sabico, L. Dominguez, M. Barbagallo, G. Duque, L. Smith & N. Al-Daghri

10:00 **OC22** PSYCHOMETRIC PROPERTIES OF THE SARQOL QUESTIONNAIRE: A SYSTEMATIC REVIEW AND META-ANALYSIS
Presenting author: C. Beaudart
Authors: C. Demonceau, C. Brabant, E. Shukuru, M. Alokail, N. Al-Daghri, Y. Rolland, I. Bautmans, J. M. Bauer, A. Cherubini, A. J. Cruz-Jentoft, B. Dawson-Hughes, R. A. Fielding, N. C. Harvey, F. Landi, M. Visser, G. Duque, R. Rizzoli, J.-Y. Reginster & O. Bruyère

10:10 **OC23** BIOLOGICAL AGE-ACCELERATION ASSOCIATIONS WITH GRIP STRENGTH LEVEL AND LONGITUDINAL CHANGE: FINDINGS FROM THE HERTFORDSHIRE COHORT STUDY
Presenting author: N. Fuggle
Author: L. D. Westbury, N. Kitaba, J. W. Holloway & E. M. Dennison

10:20 **Presentation of the ESCEO-IOF Pierre Meunier Young Scientist Award** René Rizzoli

10:30 - 12:15 - Auditorium A
SCIENTIFIC SESSION V
Chairpersons: Şansin Tüzün, Ambrish Mithal

10:30 **Presentation of the IOF Olof Johnell Science Award** Nicholas C. Harvey

10:35 **Presentation of the ESCEO-IOF Young Investigator Awards** Jean-Yves Reginster, Nicholas C. Harvey

10:40 **Presentation of the 2025 ESCEO-Aging Clinical and Experimental Research Award**
Nicola Veronese, Valentina Corio, Jean-Yves Reginster

10:45 **Plenary Lecture**
MicroRNAs: novel risk predictors in musculoskeletal disease? Luigi Gennari

11:15 **ORAL COMMUNICATIONS SELECTED FROM ABSTRACTS**

11:15 **OC24** TREATMENT-RELATED CHANGES IN TOTAL HIP BONE MINERAL DENSITY AND FRACTURE RISK REDUCTION FOR TRIALS WITH ACTIVE CONTROL AND SEQUENTIAL THERAPY: THE FNIH-ASBMR-SABRE PROJECT
Presenting author: T. Vilaca
Authors: L. Lui, M. Schini, S. Ewing, A. Thompson, E. Vittinghoff, D. C. Bauer, D. M. Black & M. L. Bouxsein

11:25 **OC25** THE PREVALENCE OF VERTEBRAL FRACTURES AND ASSOCIATED FACTORS IN THE GAMBIA, ZIMBABWE AND SOUTH AFRICA
Presenting author: K. Ward
Authors: L. Gates, C. M. Pearse, A. Burton, T. Manyanga, M. K. Jallow, B. Cassim, C. Grundy, H. Wilson, B. Mbanjwe, F. Paruk, Y. Madele, E. M. Clark, R. A. Ferrand, N. J. Crabtree & C. L. Gregson

11:35 **OC26** ENHANCING FRACTURE RISK PREDICTION: A COHORT-SPECIFIC MODEL INTEGRATING FRAXPLUS® VARIABLES FOR IMPROVED ACCURACY AND RECLASSIFICATION
Presenting author: M. Zoulakis
Authors: H. Johansson, N. C. Harvey, K. F. Axelsson, H. Litsne, L. Johansson, M. Schini, L. Vandeput, E. V. McCloskey, J. A. Kanis & M. Lorentzon

11:45 **OC27** ENGAGEMENT WITH AND TOLERABILITY OF AUGMENTED REALITY (AR) EXERGAMES AMONG OLDER WOMEN WITH OSTEOPOROSIS: RESULTS FROM A CLINICAL TRIAL
Presenting author: E. Thuilier
Authors: J. J. Carey, B. Whelan, M. Fitzgerald, J. Dingliana, M. Dempsey, S. Biggins & A. Brennan

11:55 **OC28** EFFECTS OF ANTIDIABETETIC TREATMENTS ON FRACTURE RISK
Presenting author: G. Cavati
Authors: F. Pirrotta, E. Ceccarelli, G. Dipasquale, M. Garofalo, P. Cardamone, D. Merlotti & L. Gennari

12:05 **OC29** GLP-1 RECEPTOR AGONISTS AND RISK OF BONE FRACTURES IN ELDERLY PEOPLE WITH TYPE 2 DIABETES
Presenting author: P. Rotman-Pikielny
Authors: M. Kasher Meron, T. Hornik-Lurie & G. Twig

12:15 - 13:45 - Auditorium A
SPONSORED LUNCH SYMPOSIUM
See details on the Sponsored Sessions Section

12:15 - 13:45 - Auditorium B
SPONSORED LUNCH SYMPOSIUM
See details on the Sponsored Sessions Section

14:00 - 15:00
POSTER VIEWING SESSION II

14:00 - 15:00
MEET-THE-EXPERT SESSION

MR1 **Vaccination and musculoskeletal disorders** Stefania Maggi

MR2 **Osteoporosis management in transgender patients** Jean-Marc Kaufman

MR3 **Is there a role for SYSADOAs in the management of osteoarthritis ?** Olivier Bruyère

MR4 **Biochemical markers of bone turnover: when and which?** Etienne Cavalier

14:00 - 15:00 - Podium
ORAL PRESENTATIONS OF SELECTED POSTERS
Chairperson: Elizabeth M. Curtis

14:00 **OP11 - P1425** EVALUATING THE PRAGMATISM OF SARCOPENIA CLINICAL TRIALS USING PRECIS-2: A SYSTEMATIC REVIEW
Presenting author: S. Van Heden
Authors: Z. Baoubbou, D. Sanchez-Rodriguez & C. Beaudart

14:06 **OP12 - P1387** REFINING EARLY DETECTION OF LOW BONE MINERAL DENSITY: A DEEP LEARNING MODEL FOR OSTEOPENIA SCREENING USING CHEST RADIOGRAPHS
Presenting author: S. Park
Authors: J. Park, M. Kim & H.-J. Bae

14:12 **OP13 - P147** CALCIUM ISOTOPE RATIOS IN SERUM INFORM ON SKELETAL CALCIUM BALANCE IN PATIENTS ON DIALYSIS
Presenting author: A. Eisenhauer
Authors: R. Shroff, M. Müller, A. Heuser, A. Kolevica, P. D´haese, I. Jochmans, E. Cavalier & P. Evenepoel

14:18 **OP14 - P1025** ASSOCIATIONS BETWEEN BODY COMPOSITION, EXERCISE, DIET, SHORT-CHAIN FATTY ACIDS, AND BONE LOSS IN EARLY POSTMENOPAUSAL WOMEN
Presenting author: M. Vilar Geraldi
Authors: G. Gregori, L. Johansson, U. Hjertonsson, E. Brättemark & M. Lorentzon

14:24 **OP15 - P144** CALCIUM ISOTOPES AS A NOVEL BIOMARKER FOR VASCULAR CALCIFICATION IN CKD: IMPLICATIONS FOR OSTEOPOROSIS MANAGEMENT
Presenting author: A. Dosseto
Authors: A. Fuller, A. Borst, T. Tacail, K. Lambert & H. Cheick Hassan

14:30 **OP16 - P776** FILLING GAPS IN TELEREHABILITATION: VALIDATING REMOTE SYNCHRONOUS AND ASYNCHRONOUS ASSESSMENTS OF PERFORMANCE-BASED OUTCOMES
Presenting author: Z. Boos
Authors: K. Mullen, L. Muhammad, M. K. Alshahrani & D. Pinto

14:36 **OP17 - P736** THE FIRST COMPARISON OF HIP FRACTURE INCIDENCE ACROSS 4 COUNTRIES IN AFRICA
Presenting author: K. Ward
Authors: C. L. Gregson, H. Wilson, A. Burton, M. K. Jallow, B. Trawally, L. S. Gates, T. Manyanga, J. Masters, R. A. Ferrand, M. Costa & K. Marenah

14:42 **OP18 - P498** DIFFERENTIAL ANALYSIS OF LUMBAR SPINE BONE MINERAL DENSITY AND TRABECULAR BONE SCORE IN HYPOPHOSPHATASIA PATIENTS WITH BIALLELIC VS MONOALLELIC ALPL GENOTYPE
Presenting author: F. Genest
Authors: K. Hind, M. De Gruttola, D. Hans & L. Seefried

14:48 **OP19 - P538** WHICH THRESHOLD VALUES OF CROSSLAPS TO TARGET TO PREVENT BONE LOSS AT 1 AND 2 YEARS AFTER DENOSUMAB DISCONTINUATION. THE REOLAUS STUDY
Presenting author: G. Liebich
Authors: E. Gonzalez-Rodriguez & O. Lamy

14:54 **OP20 - P1044** ABALOPARATIDE INCREASES DISTAL FEMUR BMD POST TOTAL KNEE ARTHROPLASTY
Presenting author: N. Binkley
Authors: D. Krueger, G. Borchardt, B. Nickel & P. A. Anderson

14:00 - 15:00 - MR10
EDUCATIONAL LECTURE
Osteoporosis in inflammatory rheumatic musculoskeletal diseases (iRMDs) Giovanni Adami

14:00 - 15:00 - MR5
EUGMS-ESCEO SYMPOSIUM
Fragility fractures: One size fits all?
Chairpersons: Nathalie van der Velde, Alvaro Casas Herrero

- Preventing fragility fractures in the oldest old: special considerations? Nathalie van der Velde
- Preventing fragility fractures: similarities and differences in approaches between LMICs and Europe Celia Gregson
- Integrating fall risk prevention within fracture management: practical steps to optimize implementation Tahir Masud

14:00 - 15:00 - MR6
ESCEO-OARSI JOINT SYMPOSIUM
Early knee osteoarthritis: Classification criteria for research and diagnostic criteria for clinical use
Chairpersons: Jean-Yves Reginster, Martin Englund

- Classification criteria of early-stage symptomatic knee osteoarthritis: updates of the OARSI initiative Armaghan Mahmoudian
- Diagnostic criteria for early knee osteoarthritis: Opportunities and challenges Jos Runhaar

14:00 - 15:00 - MR7
ESCEO SYMPOSIUM
Novel approaches to the stratified management of knee osteoarthritis: State of the art
Chairpersons: Ali Mobasheri, Roland Chapurlat

- The delineation of endotype and phenotype to identify the patients with knee osteoarthritis who should be treated Philip Conaghan
- The role of biomarkers (imaging, biological) to identify the patients with knee osteoarthritis who should be treated Francis Berenbaum
- Discussion leader Ali Mobasheri, Roland Chapurlat, Philip Conaghan, Francis Berenbaum

14:00 - 15:00 - MR8
EDUCATIONAL LECTURE
Biosimilars in osteoporosis management
Stuart L. Silverman

15:00 - 16:45 - MR5
COMMITTEE OF SCIENTIFIC ADVISORS SPECIAL SESSION: FUTURE OPPORTUNITIES IN THE MANAGEMENT OF OSTEOPOROSIS

Chairpersons: Eugene McCloskey, Etienne Cavalier

- Barriers and solutions for global access to osteoporosis management John A. Kanis
- Approaches to risk-based Population Screening: Insights from the ROSE study and FREM development in Denmark Katrine Rubin
- The Fact and Fiction of AI in Osteoporosis Nicholas Fuggle

15:00 - 17:00 - Auditorium A
SCIENTIFIC SESSION VI

Chairpersons: Patricia Clark, Radmila Matijevic

15:00 **Plenary Lecture**
Novel concepts: assessment of intrinsic capacity
Bess Dawson-Hughes

15:30 **ORAL COMMUNICATIONS SELECTED FROM ABSTRACTS**

15:30 **OC30** EFFECTS OF A REMOTELY-DELIVERED FUNCTIONAL RESISTANCE AND IMPACT TRAINING PROGRAM VERSUS WALKING ON PHYSICAL FUNCTION IN OLDER ADULTS WITH OBESITY UNDERGOING CALORIC RESTRICTION: A 6-MONTH RANDOMISED CONTROLLED TRIAL
Presenting author: D. Scott
Authors: P. Jansons, C. Glavas, S. Sood, M. Hunegnaw, J. Ryan, J. Mesinovic, R. Daly, A. Zengin, E. George & P. Ebeling

15:40 **OC31** MATERNAL BONE MINERAL DENSITY AT 4 YEARS POST-DELIVERY IS NOT AFFECTED BY PREGNANCY VITAMIN D SUPPLEMENTATION
Presenting author: R. Moon
Authors: S. D'Angelo, E. M. Curtis, K. A. Ward, K. M. Godfrey, C. Cooper & N. C. Harvey

15:50 **OC32** USING PROBIOTICS TO SUPPORT BONE HEALTH IN POSTMENOPAUSAL WOMEN: A RANDOMIZED, DOUBLE-BLIND, PARALLEL, PLACEBO-CONTROLLED, MULTI-CENTRE STUDY
Presenting author: J. Yumol
Authors: S. Binda, V. Nagulesapillai & W. E. Ward

16:00 **OC33** RELATIONSHIPS BETWEEN MICRORNAS AND CORTICAL BONE IN CHRONIC KIDNEY DISEASE
Presenting author: T. L. Nickolas
Authors: C. Metzger, N. Chen, D. Mcmahon, M. Allen, R. Moyses & S. Moe

16:10 **OC34** FRAGILITY FRACTURES MANAGEMENT IN PREGNANCY BY REMS TECHNOLOGY: THE PREGNANCY OSTEOPOROSIS INITIATIVE (POI)
Presenting author: V. Degennaro
Authors: T. Bignardi, A. Bulfoni, I. Cetin, A. Cromi, G. Franzoni, F. Ghezzi, M. Ossola, H. Valensise, T. Ghi & M. L. Brandi

16:20 **OC35** INTERACTIONS BETWEEN CALCIUM AND PROTEIN INTAKES, AND OSTEOPOROSIS MEDICATIONS ON HIP BONE STRENGTH: AN OBSERVATIONAL STUDY IN OLDER WOMEN
Presenting author: M. Papageorgiou
Authors: Y. Gugler, S. Ferrari, R. Rizzoli, P. Zysset & E. Biver

16:30 **Plenary Lecture**
Osteoimmunology: a legacy discipline?
Willem Lems

17:00 - 18:00 - Auditorium B
EDUCATIONAL LECTURE

Pregnancy - and lactation-related osteoporosis
Maria Luisa Brandi

17:00 - 18:00
NON-SPONSORED SYMPOSIA

MR1 **Bone, Muscle and Fat interractions in neurodisabled persons**

Chairperson: Ifigenia Kostoglou-Athanassiou

- Introduction in bone, muscle and fat interactions Ifigenia Kostoglou-Athanassiou
- (Osteo)Sarcopenia and sarcopenic obesity in neurodisabled individuals Yannis Dionyssiotis
- Sarcopenia in Hemiplegia and Stroke Maria Papadatou
- Discussion in bone, muscle and fat interactions Ifigenia Kostoglou-Athanassiou

MR2 **From bone metastasis to osteoporosis - Joint IOF and CABS Symposium (Cancer and Bone Society)**
Chairpersons: Patricia Juarez-Camacho, Peyman Hadji

- Decoding skeletal complications in bone metastases Patricia Juarez-Camacho
- Treatment of bone metastasis – state of the art 2025 Cyrille Confavreux
- CTIBL – size of the problem and treatment options? Peyman Hadji

MR3 **The Latest in Artificial Intelligence in Osteoporosis: From Large Language Models to Computer Vision**
Chairperson: Nicholas Fuggle

- What are 'A Large Language Models' and how can they be deployed in osteoporosis? Nicholas Fuggle
- Health Equity considerations when using AI in Clinical Practice Joe Alderman
- AI for vertebral fracture screening: A UK perspective – An update from the ADOPT study Kassim Javaid

MR4 **Improving and Enhancing DXA Practices; A joint symposium with ISCD and IOF**
Chairpersons: Nicholas C. Harvey, William D. Leslie

- DXA Quality, Common Errors and Clinical Impact Neil Binkley
- The ABCs of DXA and How to Improve fractures Diane Krueger
- Expanding DXA Functionality to Enhance Clinical Care Kate Ward

MR5 **The challenge of oral health in patients with osteoporosis: A pragmatic approach**
Chairpersons: Jorge Luis Alberto Morales Torres, Osvaldo Daniel Messina

- Introduction: Oral health and bone health. A quotidian dilemma? Jorge Luis Alberto Morales Torres, Osvaldo Daniel Messina
- The overall impact of oral health in the elderly Hugo Gutiérrez Hermosillo
- Osteoporotic fractures and MRONJ: Sobering statistics Francisco Fidencio Cons Molina
- Improving oral screening: the Oral Health Assessment Tool Jorge Luis Alberto Morales Torres
- Discussion: Whose task is it to identify oral health?
- Conclusions Jorge Luis Alberto Morales Torres

MR6 **Skeletal fragility: The role of vitamin D and K in CKD patients**
Chairpersons: Maria Fusaro, Thomas L. Nickolas

- Vitamin D: from native to active form in CKD-associated osteoporosis Rosa Moyses
- Vitamin K: instructions for use in skeletal fragility Maria Fusaro
- The Statistician in detecting fraud and negligence in clinical trials Giovanni Tripepi
- Vitamin D in Skeletal Fragility: Clinical Case Hanne Jorgensen
- Discussion

MR7 **Breaking Barriers and Advancing Bone Health for People with Intellectual Disability**
Chairperson: Éilish Burke

- The Silent Epidemic of Osteoporosis among Adults with Intellectual Disabilities Éilish Burke
- Exploring Dietary Deficiencies in Adults with Intellectual Disabilities Contributing to Poor Bone Health Judy Ryan
- Sedentary Behaviour and its Implications for the Bone Health of those with Intellectual Disability Louise Lynch
- Innovative Solutions: The Echolight Rems Device for Accessible Bone Health Screening for Adults With Intellectual Disability Anne Power

MR8 **New horizons in sarcopenia: From pediatric reference values to emerging therapeutic advances**
Chairpersons: Gulistan Bahat, Radmila Matijevic

- Recognizing and managing Sarcopenia in Children: Reference muscle mass values from a European cohort Taha Kizilkurt
- Molecular Insights, Pathways and Candidates for Novel Interventions in Sarcopenia Serdar Ozkok

08:00 - 09:00

NON-SPONSORED SYMPOSIA

MR1 Update on the Study to Advance BMD as a Regulatory Endpoint (SABRE): What Might Osteoporosis Trials look like in the Future?

Chairperson: Mary Bouxsein

- Challenges of Clinical Trials for New Osteoporosis Medications Eugene McCloskey
- Evidence Supporting the Use of BMD as a Surrogate Endpoint for Fractures Richard Eastell
- Considerations for designing trials that use BMD as a Primary EndpointKyphoplasty Dennis Black

MR2 Improving Women's Bone Health Throughout the Lifespan

Chairpersons: Adriana Orcesi Pedro, Maria Celeste Osório Wender

- Opening and Welcome from FEBRASGO Maria Celeste Osório Wender
- Bone Consequences of Premature Ovarian Insufficiency (POI) Jaime Kulak Jr.
- The Role of Hormone Therapy in the Management of Postmenopausal Maria Celeste Osório Wender
- Evaluation and management of osteopenia and osteoporosis in breast cancer survivors Adriana Orcesi Pedro

MR3 Perioperative Bone Optimization in Arthroplasty Candidates with Osteoporosis

Chairperson: Rafael Jimenez-Umbarila

- Updated Joint Positions on Perioperative Bone Optimization in Arthroplasty Candidates 2024 Roberto E. Lopez Cervantes
- Current Practices, Needs, and Challenges in Periprosthetic Bone Mineral Density Assessment: Towards Standardization J. Francisco Torres Naranjo
- Current Practices and Educational Needs in Perioperative Bone Optimization for Arthroplasty Candidates: Survey Results José Máximo Gomez-Acevedo

MR4 The intimate relationship between adipose and bone tissue

Chairperson: Yannis Dionyssiotis

- Adipose and bone tissue. A close relationship Ifigenia Kostoglou-Athanassiou
- Metabolic syndrome. A paradigm of the intimate relationship between adipose and bone tissue Panagiotis Athanassiou
- Metabolic syndrome and osteoporosis Yannis Dionyssiotis
- Metabolic syndrome and diet. Do they affect bone mass? Lambros Athanassiou
- Metabolic syndrome and depression Yannis Athanassiou

MR7 Developing Clinical Practice Guidelines for Osteoporosis Diagnosis and Management in Middle-Income Countries: Challenges and Opportunities

Chairperson: Geraldine Altamar

- Why a clinical practice guideline in a middle-income country like Colombia? Geraldine Altamar
- Challenges in the development of clinical practice guidelines in a middle-income country Adriana Medina
- Opportunities in the development of clinical practice guidelines Monique Chalem

MR8 European and American Efforts to Educate the Public and Health Care Professionals on the Connection Between Spine and Bone Health

Chairperson: Rita Roy

- Osteoporosis and the Spine Overview: Key Statistics and an Overview of the National Spine Health Foundation's Key Patient and Health Care Professional Initiatives Rita Roy
- A Spine Surgeon Perspective on the Need for Spine and Bone Health Optimization Paul Anderson
- A European Perspective on Key Spine Surgeon Gaps in the Diagnosis and Treatment of Osteoporotic Patients Jean Charles Le Huec

MR10 Navigating the Complex Interplay of Aging, Chronic Kidney Disease, and Osteoporosis: Case-Based Challenges and Treatment Insights

Chairpersons: Nathalie van der Velde, Tahir Masud

- Setting the Stage: Understanding the Intersection of Aging, CKD, and Osteoporosis – Key Concepts and Clinical Approaches Savas Ozturk
- Managing Skeletal Fragility in the Context of CKD: Practical Insights Richard Keen
- Real-World Challenges and Personalized Strategies in Diagnosis and Treatment Gulistan Bahat

08:00 - 09:00 - MR5
ESCEO SYMPOSIUM ON PTH1 RA
Use of parathyroid hormone receptor agonists in the management of osteoporosis: State of the art
Chairpersons: Nicholas C. Harvey, Claudia Campusano

- Pharmacological mode of action
  Nicholas C. Harvey
- Anti-fracture efficacy of PTH R1A
  Nicola Veronese
- Safety of PTH R1A in the management of osteoporosis Elizabeth M. Curtis
- Discussion leader Bernard Cortet

08:00 - 09:00 - MR6
SICOT-ESCEO-IOF SYMPOSIUM
Fragility Fractures - Importance of Interdisciplinary Management
Chairpersons: Veronika Koeppen-Ursic, Marc Hanschen

- Fragility Fractures of the Pelvic Ring – Minimal Invasive Treatment Options
  Marc Hanschen
- Decision Making in the Management of Fragility Fractures of the Acetabulum
  Umberto Mezzadri
- Interdisciplinary Comprehensive Care of Fragility Fractures in Germany
  Veronika Koeppen-Ursic
- 15 Years of Experience with Atypical Femoral Fractures Jörg Schilcher

09:00 - 10:00
POSTER VIEWING SESSION III

09:00 - 10:00
MEET-THE-EXPERT SESSION

MR1 **Magnesium, nutrition and musculoskeletal disorders** Nicola Veronese

MR2 **GIOP: present and future** Giovanni Adami

MR3 **Artificial intelligence in patient management** Nicholas Fuggle

MR4 **Osteoarthritis: a bone or a joint disorder?** Roland Chapurlat

09:00 - 10:00 - MR5
SPONSORED MEET-THE-EXPERT SESSION
See details on the Sponsored Sessions Section

09:00 - 10:00 - MR6
ESCEO-EMAS JOINT SYMPOSIUM
Risks and management of osteoporosis in menopausal women
Chairpersons: Angelica Lindén Hirschberg, Radmila Matijevic

- Association between early menopause and fracture risk Panagiotis Anagnostis
- Ovarian volume and bone mineral density in postmenopausal women Eleni Armeni
- What do current guidelines recommend about MHT and osteoporosis prevention in menopausal women? Angelica Lindén Hirschberg

10:00 - 12:00 - Auditorium A
SCIENTIFIC SESSION VII
Chairpersons: Lakshmi Nagendra, Claudia Campusano, Manju Chandran

10:00 **Plenary Lecture**
When should we consider moving from medical to surgical management in osteoarthritis of the knee and hip? Philip Conaghan

10:40 **ORAL COMMUNICATIONS SELECTED FROM ABSTRACTS**

10:40 **OC36** A NATIONAL SURVEY OF AUSTRALIAN PRIMARY CARE CLINICIANS' KNOWLEDGE, BELIEFS, ATTITUDES, PRACTICES, PERCEPTIONS OF RESPONSIBILITY AND BARRIERS AND ENABLERS TO IDENTIFICATION AND MANAGEMENT OF SARCOPENIA
Presenting author: R. M. Daly
Authors: D. Scott, N. Kiss, M. Tieland, B. J. Braguley, J. J. Fyfe & R. Manocha

10:50 **OC37** AUTOMATED ABDOMINAL AORTIC CALCIFICATION EXTENT IS ASSOCIATED WITH MUSCLE COMPOSITION, STRENGTH AND SARCOPENIA: THE UK BIOBANK IMAGING STUDY
Presenting author: M. Sim
Authors: A. Gebre, C. Smith, J. Webster, A. Saleem, S. Z. Gilani, G. Duque, E. L. Duncan, N. K. Hong, P. Raina, D. P. Kiel, J. P. Kemp, Y. Zhong, R. M. Daly, J. T. Schousboe, W. D. Leslie, R. L. Prince, N. C. Harvey & J. R. Lewis

11:00 **OC38** ROMOSOZUMAB AND DENOSUMAB COMBINATION THERAPY IN POSTMENOPAUSAL OSTEOPOROSIS
Presenting author: G. Adami
Authors: F. Pollastri, C. Benini, A. Piccinelli, F. Montanari, D. Gatti, O. Viapiana & M. Rossini

11:10 **OC39** FIVE-YEARS OF CALCIUM SUPPLEMENTATION IS NOT ASSOCIATED WITH LONG-TERM RISK OF DEMENTIA IN OLDER WOMEN: POST-HOC ANALYSIS FROM A RANDOMISED CLINICAL TRIAL
Presenting author: M. Sim
Authors: N. Ghasemifard, J. R. Lewis, S. Radavelli-Bagatini, S. M. Laws, B. Stephan, K. Zhu, J. M. Hodgson & R. L. Prince

11:20 **OC40** THE EFFECT OF DENOSUMAB ON FUNCTIONAL RECOVERY IN OLDER PATIENTS UNDERGOING SURGICAL FIXATION FOR INTERTROCHANTERIC FEMORAL FRACTURE: A RANDOMIZED, PLACEBO-CONTROLLED TRIAL
Presenting author: P. Athakitkarnka
Authors: E. Vanitchareonkul, A. Unnanuntana & P. Chotiyarnwong

11:30 **Plenary Lecture**
Successful fracture healing: do osteoporosis and its treatment matter? Manju Chandran

12:00 - 13:00
NON-SPONSORED SYMPOSIA

MR1 **HIV, bone quality and quantity, and fracture risk: insights from studies in Zimbabwe and South Africa**
Chairpersons: Lisa Micklesfield, Teréza Hough
- HIV and it's treatments on fracture risk: a scoping review Celia Gregson
- Fractures E3 focussing on vertebral fractures Kate Ward
- Clinical risk factors associated with fracture risk in middle-aged men and women from Soweto, Johannesburg: findings from the Middle-aged Soweto Cohort (MASC) Lisa Micklesfield
- The influence of HIV on bone quality, quantity and fracture risk in midlife women: findings from a cross-sectional study in Zimbabwe Celia Gregson

MR2 **Potential driving mechanisms behind sarcopenia: where are we now?**
Chairperson: Evelien Gielen
- Exploring the role of inflammageing in sarcopenia – a quick overview Jolan Dupont
- The gut-muscle axis in sarcopenia: bridging gut microbiota, inflammation and diet Laurence Lapauw
- Sarcopenia and the Brain: unravelling the Muscle-Brain Axis in the development and treatment of Sarcopenia Nadjia Amini
- Conclusion and discussion of the symposium Evelien Gielen

MR3 **Fibromyalgia. Pain and musculoskeletal manifestations**
Chairperson: Panagiotis Athanassiou
- Fibromyalgia as a systemic autoimmune disease affecting the bone Panagiotis Athanassiou
- Fibromyalgia in the context of autoimmune rheumatic diseases Lambros Athanassiou
- Fibromyalgia in the context of autoimmune thyroid disease Ifigenia Kostoglou-Athanassiou
- Fibromyalgia and pain Ippokratis Sanidis
- Fibromyalgia, pain and psychological implications Yannis Athanassiou

MR4 **Managing the Discontinuation of Denosumab Therapy**
Chairperson: David Kendler
- Denosumab: Long-term Therapy and Discontinuation Michael McClung
- Managing Denosumab Discontinuation in Patients with Osteoporosis Bente Langdahl
- Managing the Discontinuation of Denosumab in Patients on Hormone Ablative Therapy for Non-metastatic Cancer with Osteoporosis Yumie Rhee

MR5 **The Importance of Osteosarcopenia Today**
Chairpersons: Nasser Al-Daghri, Gustavo Duque
- Epidemiological facts about osteosarcopenia Shaun Sabico
- The molecular pathways of osteosarcopenia Gustavo Duque
- How to treat osteosarcopenia Nicola Veronese

MR6 **Latin American Patients' perceptions on osteoporosis diagnosis and treatment. The IOF Patient Advisory Group in Latin America**
Chairperson: Joan Levin
- The LATAM PAG materials and methods
  Patricia Clark
- Key findings and results Adriana Orcesi Pedro
- Listening to the patient's voice Roberto E. Lopez Cervantes
- Question & Answer
- Closing

MR7 **Where Do We Stand in the Non-Pharmacological Treatment of Osteoporosis?**
Chairperson: Pinar Borman
- Introduction to Non-Pharmacological Treatments in Osteoporosis
  Pinar Borman, Belgin Karaoglan
- Exercise in Osteoporosis Aysegul Yaman
- Physical Therapy Modalities in Osteoporosis and its complications Sefa Gümrük Aslan
- Microbiota and Diet in Osteoporosis
  Pinar Borman

MR8 **The effect of hormonal treatment and cancer on bone health**
Chairperson: Giuseppe Guglielmi
- Diagnostics methods for studying the bone damage in cancer patients Li-Gang Cui
- How can short-term monitoring be helpful to assess bone fragility in breast cancer patients? Elena Bischoff
- Management of bone fragility in prostate cancer patients Giuseppe Guglielmi

MR10 **Sleep apnea and Sarcopenia: a dream combo**
Chairperson: Bruno Muzzi Camargos
- Sleep disorders and sarcopenia - Assessment by Polysomnography Oslei De Matos
- Sarcopenia and Osteoporosis - Assessment by Dual X-Ray Absorptiometry (DXA)
  Bruno Muzzi Camargos
- Questions and Answers

08:00 - 09:00 - Auditorium B

GEDEON RICHTER SPONSORED BREAKFAST SATELLITE SYMPOSIUM - RESTORING BONE STRENGTH: IT TAKES TWO TO DANCE A TANGO

Chairpersons: Serge Ferrari, Salvatore Minisola

- Welcome & introduction
- Targeting the structural determinants of bone fragility Serge Ferrari
- Clinical benefits of sequential and combination therapies with teriparatide and anti-resorptives Benjamin Leder
- Discussion and Q&A

12:15 - 13:45 - Auditorium A

UCB SPONSORED LUNCH SATELLITE SYMPOSIUM - ROMOSOZUMAB: RIGHT PATIENT, RIGHT TIME

Chairperson: Salvatore Minisola

- A defining era in osteoporosis management Salvatore Minisola
- Rethinking bone building with romosozumab Lothar Seefried
- Optimising outcomes with romosozumab first Kassim Javaid
- Recognising the opportunity with romosozumab Bente Langdahl
- Faculty Q&A
- Looking to a stronger future Salvatore Minisola

12:15 - 13:45 - Auditorium B

VIATRIS SPONSORED LUNCH SATELLITE SYMPOSIUM - ADVANCING OSTEOARTHRITIS CARE: INTEGRATING EARLY INTERVENTION, MULTIMODAL APPROACHES, AND PATIENT-CENTERED MANAGEMENT

Chairperson: Jean-Yves Reginster

- Rising OA Incidence: Early Intervention and SYSADOAs for Effective Management Nicholas Fuggle
- From Pain to Precision: Choosing an NSAID for Osteoarthritis Management Ernest Choy
- Integrating Multimodal Approaches for Comprehensive OA Management Juan Javier Lichauco

14:00 - 15:00 - MR5

PROMEDIUS SPONSORED HONORARY LECTURE: DISCOVERING NEW HORIZONS IN BONE HEALTH WITH ARTIFICIAL INTELLIGENCE

Chairpersons: Jean-Yves Reginster, Nicholas Fuggle

- Introduction of a chest X-ray based opportunistic osteoporosis screening AI solution Hyun-Jin Bae
- Cost-effectiveness analysis of opportunistic osteoporosis screening using chest X-ray Mickael Hiligsmann
- Journey to find optimal fracture risk prediction model based on chest X-rays Sunghye Kong
- Panel discussion

17:00 - 18:30 - Auditorium A

ECHOLIGHT SPONSORED SATELLITE SYMPOSIUM - REMS EARLY DIAGNOSES AS EFFECTIVE STRATEGIES FOR FRACTURE PREVENTION

Chairpersons: Jean-Yves Reginster, Nicholas C. Harvey

- REMS technology for fracture prevention Andreas Kurth
- REMS suitability in secondary osteoporosis Giovanni Adami
- Bone health management in pregnancy Maria Luisa Brandi
- Economic Benefits of REMS Mickael Hiligsmann
- REMS: Bone density assessment without ionising radiation - an alternative to DXA? Nicholas Fuggle

08:00 - 09:00 - Auditorium B

SANDOZ SPONSORED BREAKFAST SATELLITE SYMPOSIUM - BIOSIMILAR DENOSUMAB FROM THEORY TO PRACTICE: OPPORTUNITY, EVIDENCE AND FIRST REAL-WORLD EXPERIENCE

Chairperson: Richard Eastell

- Welcome and introduction Richard Eastell
- Treatment gaps in osteoporosis and 78-week data from the ROSALIA study of biosimilar denosumab Richard Eastell
- Realizing the opportunity: informational needs and real-world switch experience in Canada Tayyab Khan
- Q&A Session
- Closing remarks Richard Eastell

12:15 - 13:45 - Auditorium A

THERAMEX SPONSORED LUNCH SATELLITE SYMPOSIUM - ABALOPARATIDE▼ IN POSTMENOPAUSAL OSTEOPOROSIS WOMEN: REAL-WORLD EVIDENCE AND CLINICAL APPROACHES

Chairperson: Jean-Yves Reginster

- Welcome and Opening Remarks Jean-Yves Reginster
- Real-World Evidence in Abaloparatide Therapy: Insights and Implications for Clinical Practice Jeffrey Curtis
- Abaloparatide in Action: Patient Profile and Treatment Protocols Esteban Jodar
- Abaloparatide in Action: Patient Profile and Treatment Protocols Jeffrey Curtis
- Panel Discussion: Are PTH (Parathyroid Hormone) agonists similar or different? Insights from Experts
  Moderator: Jean-Yves Reginster
  Panelists: Bernard Cortet, Maria Luisa Brandi, Heide Siggelkow, Jeffrey Curtis, Esteban Jodar
- Question & Answers

12:15 - 13:45 - Auditorium B

AMGEN SPONSORED LUNCH SATELLITE SYMPOSIUM - IS A TREAT TO TARGET (T2T) APPROACH REALISTIC IN OSTEOPOROSIS PATIENTS AT HIGH FRACTURE RISK?

Chairperson: Serge Ferrari

- Introduction Serge Ferrari
- Lessons from T2T strategies in rheumatic disorders Willem Lems
- T2T in current task forces/guidelines: Where are we now? Bente Langdahl
- Can we achieve a long-term goal in OP with current drugs? Serge Ferrari
- Panel Discussion and audience Q&A
- Closing Remarks

09:00 - 10:00 - MR5

ALEXION SPONSORED MEET-THE-EXPERT SESSION: COULD IT BE HYPOPHOSPHATASIA (HPP)? A CONVERSATION WITH EXPERTS

Chairpersons: Maria Luisa Brandi, Lothar Seefried

- Welcome and introductions Maria Luisa Brandi
- Overview of HPP in adults from an endocrinologist's perspective Maria Luisa Brandi
- Challenges in HPP management Lothar Seefried
- Practical approaches to multidisciplinary HPP management: Interactive discussions and questions from the audience
  Maria Luisa Brandi, Lothar Seefried
- Conclusions and summary Maria Luisa Brandi

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WORLD CONGRESS ON OSTEOPOROSIS, OSTEOARTHRITIS AND MUSCULOSKELETAL DISEASES

Abstract Book

Pre-Congress Symposium Abstracts

PRE-CONGRESS1

INTRODUCTION - OSTEOPOROSIS VS RENAL OSTEODYSTROPHY

P. Evenepoel[1]

[1]Department of Medicine, Division of Nephrology University Hospital Gasthuisberg, Leuven, Belgium

In patients with chronic kidney disease (CKD), optimal control of mineral and bone disorder (MBD) is important not only to preserve cardiovascular health, but also to prevent debilitating skeletal complications. Patients with CKD experience a multifold increased fracture risk compared to age and sex matched controls and the risk of mortality following a hip fracture is substantially higher. Most cumbersome, the treatment gap, being already huge in postmenopausal women is even more pronounced in patients with CKD. Lack of evidence from randomized controlled trials, fear for complications, and incomplete understanding of the complex pathophysiology of bone fragility in CKD fuel therapeutic inertia. Participants of the 2023 Madrid CKD-MBD KDIGO Controversies Conference raised the concern that the term ROD may represent a roadblock to managing fracture risk as it fosters an overly PTH- and calcium–phosphate-centric approach to bone disease management. Therapies focusing on these pathogenic drivers, however, failed to meet expectations. Conference participants argued that treatment of renal bone disease should be re-centered to the skeleton itself and that a change in terminology might facilitate this paradigm shift. The term CKD-associated osteoporosis was proposed to acknowledge and emphasize that ROD is a disorder of bone strength that increases fracture risk in the setting CKD. Diagnostic work up and therapy will be similar to what is proposed for other osteoporosis conditions, but need to be individualised with knowledge of CKD. While CKD-MBD biochemical abnormalities cannot be dissociated from the relevant clinical outcomes of bone loss and fractures, additional efforts are needed to better understand mechanisms by which uremia, altered gut and immune systems, inflammation, and medications affect the CKD-associated osteoporosis phenotype. The bone phenotype can be assessed by bone imaging and bone biomarkers. Within the new framework, the treatment targets of PTH should be considered in the context of bone phenotype. This makes sense if we consider that a key feature of hyperparathyroidism in CKD is a reduced and variable skeletal response to PTH. The metabolic bone component of CKD-associated osteoporosis is best evaluated by a bone biopsy. However, the key parameter of bone turnover, which has implications for treatment options, can be non-invasively assessed using bone turnover markers.

PRE-CONGRESS2

BONE HISTOLOGY - OSTEOPOROSIS VS RENAL OSTEODYSTROPHY

D. W. Dempster[1]

[1]Vagelos College of Physicians and Surgeons of Columbia University, New-York, United States

Histomorphometric analysis of the iliac crest bone biopsy is one of the most powerful techniques to study bone metabolism. It owes its strength to the ability to produce, high quality undecalcified sections of bone and the use of tetracycline antibiotics to provide dynamic assessment of bone formation rate, as well as disorders of mineralization. In the 1960's through the 1980's the technique was used widely in the clinical assessment of patients with bone disease. Nowadays, with the advent of bone densitometry and biochemical markers of bone turnover, the technique is rarely used in a clinical setting, except in the management of patients with renal osteodystrophy (RD).

In this setting, biochemical markers are poor predictors of bone turnover and densitometry does not distinguish between osteomalacia and other manifestations of RD. The biopsy has taught us that RD can present in several distinct forms: high bone turnover (osteitis fibrosa), osteomalacia, low turnover (adynamic bone) and mixed bone disease, commonly referred to under the umbrella of CKD-MBD. Concomitantly, patients with CKD-MBD also frequently present with osteoporosis.

The speaker will compare the histomorphometric profile of patients with osteoporosis in the setting of CKD-MBD with that in postmenopausal and age-related osteoporosis. He will also present examples of the effects of approved osteoporosis medications on bone structure and turnover in patients with CKD-MBD, as revealed in paired bone biopsies before and after treatment.

PRE-CONGRESS3

DIAGNOSIS: BIOCHEMISTRY & IMAGING – OSTEOPOROSIS VS. RENAL OSTEODYSTROPHY

T. L. Nickolas[1]

[1]David C. and Betty Farrell Professor of Medicine Chief, Division of Bone and Mineral Diseases Washington University School of Medicine, St. Louis, United States

Distinguishing osteoporosis from renal osteodystrophy remains a major challenge in clinical practice. While both conditions lead to bone fragility and an increased risk of fractures, their underlying pathophysiology differs, necessitating distinct diagnostic and therapeutic approaches.

Imaging techniques such as dual-energy X-ray absorptiometry (DXA) are widely used for assessing bone mineral density (BMD) and diagnosing osteoporosis and monitoring treatment efficacy. However, DXA alone cannot differentiate osteoporosis from the bone disorders associated with chronic kidney disease (CKD), including disorders of turnover and mineralization.

Biochemical markers offer a more nuanced, non-invasive approach

to distinguish these conditions. Serum parathyroid hormone (PTH) and bone turnover markers, such as bone-specific alkaline phosphatase (BSAP) and tartrate-resistant acid phosphatase 5b (TRAP5b), provide insight into bone remodeling activity. In CKD, abnormalities in calcium, phosphate, fibroblast growth factor-23 (FGF-23), and vitamin D metabolism further contribute to bone pathology.

Besides DXA, advanced imaging techniques, such as high-resolution peripheral quantitative computed tomography (HR-pQCT), trabecular bone score (TBS) and hip structural analysis, may help assess cortical and trabecular microarchitecture, potentially improving the differentiation between osteoporosis and renal osteodystrophy. Serial HR-pQCT imaging and PET/CT imaging may even provide insight into bone remodeling activity. However, these methods are not yet widely implemented in routine clinical practice.

A comprehensive diagnostic approach that integrates biochemical assessment with imaging findings is essential for more accurate non-invasive identification of bone disease in patients with CKD. This distinction is critical for guiding appropriate treatment strategies, as antiresorptive and anabolic therapies commonly used for osteoporosis may be contraindicated or require caution in patients with CKD-related bone disorders.

PRE-CONGRESS4

VASCULAR CALCIFICATION IN CHRONIC KIDNEY DISEASES- METABOLIC BONE DISEASES & ASSOCIATED OSTEOPOROSIS

Z. A. Massy[1,2]

[1]AURA (Association pour l'Utilisation du Rein Artificiel), Paris, France, [2]Centre for Research in Epidemiology and Population Health (CESP), Paris-Saclay University, Versailles Saint Quentin University, INSERM U1018, Clinical Epidemiology Team, Villejuif, and FCRIN INI-CRCT, Nancy, France

Chronic Kidney Disease (CKD) affects nearly 10% of the population. Individuals at all stages of CKD have a higher risk of developing cardiovascular calcification (CVC) and bone fragility. The latter is due to the CKD-associated bone and mineral disorder (CKD-MBD), frequently and age- and sex- dependent osteoporosis.

CVC presence is correlated with higher cardiovascular and all-cause mortality risk. Clinical, epidemiological and imaging evidence links arterial and valvular calcifications to arterial stiffness, valve stenosis and/or regurgitation in patients with CKD. CVC results from complex cellular interactions involving the endothelium, vascular/valvular cells (i.e., vascular smooth muscle cells, osteoblast-like cells, valvular interstitial cells and resident fibroblasts), and monocyte-derived macrophages. CKD is associated with various metabolic dysregulations such as inflammation and accumulation of uremic toxins, favoring the genesis and the progression of CVC. CKD, which is a model of accelerated aging, is but one key factor for the development of CVC in such patients.

Bone fragility is due to reduced bone quantity, reflected by decreased bone mineral density (BMD), as well as impaired bone quality, reflected by abnormal bone turnover, mineralization, matrix composition, collagen fiber arrangement, and microarchitecture. CKD related osteoporosis is an additional mechanism predisposing to increased fracture risk, and a higher risk of fracture-associated mortality. The incidence of fractures increases with the progression of CKD, in favor of a CKD-specific bone disorder . Since the relationship between BMD and bone fracture is less marked in patients with CKD than in the general population the predictive value of low BMD for type of bone disease and fracture risk is lower in those with kidney failure. This is due to a more complex pathophysiology of bone fragility in CKD, resulting from a combination of age-related factors, disturbances of mineral and endocrine metabolism, sex-related hormonal deficiencies, uremic toxins and inflammation.

A large number of studies on CKD patients have demonstrated associations between CVC and bone pathologies. The nature of these associations is not yet completely understood. It could result from 1) a direct action of molecules secreted by bone on vascular structure and function; 2) compromised skeletal blood supply secondary to alterations of bone vessel structure and reduced blood flow; and 3) common factors acting on both bone remodeling and CVC. Uremic toxins, senescence, and inflammation are probably the principal common pathways linking bone and arterial pathologies. Some of these common risk factors are modifiable and represent potential targets for intervention.

PRE-CONGRESS5

CURRENT THERAPEUTIC OPTIONS – OSTEOPOROSIS (OP) & RENAL OSTEODYSTROPHY (ROD)

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In agreement with the definition of OP, ROD is now regarded as a secondary type of OP. Chronic renal failure patients (CRF) experience a long clinical history of progressive metabolic derangements in mineral and bone homeostasis, with variable degrees of bone material properties derangements and bone fragility. Importantly, the different types of substitutive therapies (hemo- or peritoneal dialysis or transplantation) can differently impact bone disease. Accordingly, the first step when evaluating OP & ROD is to aim at phenotyping the CRF patients by means of biomarkers and instrumentals. Predictably, lower glomerular filtration rates (GFR) will be associated with more severe metabolic derangements, but also with lower renal excretion of bone markers. For this reason, the diagnostic value of serum PTH, whose levels are affected by reduced renal excretion and by sub-optimal standardization of assay methods, has been challenged and suggested to reflect parathyroid hyperplasia better than bone turnover. Thus, type and severity of ROD, if not by the gold-standard bone biopsy, should be evaluated by bone biomarkers unaffected by reduced renal excretion. Namely, bone formation should be evaluated by serum levels of bone specific alkaline phosphatase (BALP) and intact procollagen type I N-terminal peptide (PINP),

while bone resorption should be estimated with tartrate resistant acid phosphatase (TRAP5b). Bone mineral density, which underestimates fracture risk in CRF, is nonetheless recommended for screening and therapeutic follow-up above the age of 50 years in males and females. Vertebral morphometry will help identifying asymptomatic fractures thus further characterizing patients. Acid base balance and concomitant drugs will complete the clinical assessment. Therapeutic strategies will first aim at controlling secondary hyperparathyroidism and then at affecting bone turnover by choosing among the different anti-osteoporotic drugs which are capable of modifying bone formation or bone resorption. For these drugs, specific pharmacokinetic considerations are necessary according to the degree of residual GFR and to the specific requirements of renal patients to avoid side effects. Importantly, other contributing elements of increased fracture risk (e.g. lifestyle, diet and drugs) should be taken into account. As a whole, tailoring therapy is the main challenge in patients with CRF associated OP.

PRE-CONGRESS6

INTERMITTENT PTH ADMINISTRATION IN THE MANAGEMENT OF CKD-MBD

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Osteoporosis and chronic kidney disease-metabolic bone disease (CKD-MBD) often coexist, particularly in the elderly. Intermittent parathyroid hormone (PTH) therapy is the standard anabolic treatment for osteoporosis and is also used to manage adynamic bone disease, a common form of renal osteodystrophy.

Phosphorus retention—a hallmark of CKD—begins early, even before hyperphosphatemia develops, followed by compensatory rises in fibroblast growth factor 23 (FGF-23) and later PTH to enhance phosphate excretion. However, phosphate retention alone does not fully explain CKD-MBD. Equally critical is the **delayed PTH response to calcium-phosphate imbalances** in driving the cascade of events leading to CKD-MBD. It is also imperative to recognize that the hyperparathyroidism seen in advanced CKD represents **secondary hyperparathyroidism (2° HPT)**—a reactive process, not a primary disorder.

The management of CKD-MBD remains a significant clinical challenge, as the effectiveness of current therapeutic regimens to prevent and treat CKD-MBD is limited. Therefore, targeting the delayed PTH response in the early stages of phosphorus retention may offer a more effective strategy for preventing disease progression.

Administering intermittent PTH in patients with early stages CKD could mitigate phosphorus retention before compensatory mechanisms are triggered. This early intervention may help limit or even avert the rise of FGF-23 and PTH, both of which are key contributors to the skeletal and cardiovascular complications associated with CKD. Several studies support this potential outcome. Additional benefits may include the anabolic effects on bone from intermittent PTH administration, contrasting with the catabolic effects observed with continuously elevated PTH concentrations, as well as the prevention of 2o HPT.

WCO IOF-ESCEO

2025 ROME

WORLD CONGRESS ON OSTEOPOROSIS, OSTEOARTHRITIS AND MUSCULOSKELETAL DISEASES

Abstract Book

Opening Ceremony Abstracts

OPENING1

REVIVAL OF THE EUROPEAN MEDICINES AGENCY ACTIVITIES ORIENTED TOWARDS OLDER PEOPLE

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In 2011 the EMA published its geriatric medicines strategy, and in 2018 was the first major regulatory agency worldwide to issue guidance on considering frailty rather than chronological age as a stratification factor in registration clinical trials (*Reflection paper on physical frailty: instruments for baseline characterisation of older populations in clinical trials*). Additional guidance paying specific attention to age-adapted packaging and formulation followed. The last 5 years have seen a slowing down of activity due to resource challenges due to Brexit and Covid. At the end of 2024 a new group of geriatric experts was nominated to support the EMA activities. Efficiency and targeted actions are clearly important in a resource-poor environment: how can healthcare professionals and patients support an effective implementation of the Geriatric Strategy to ensure that that medicines for older people are of high quality and appropriately researched and evaluated throughout their lifecycle?

OPENING2

NEW PERSPECTIVES IN THE MANAGEMENT OF PATIENTS WITH OSTEOPOROSIS

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Osteoporosis is a bone disease affecting a growing number of individuals globally. Its underlying pathologic processes, such as estrogen deficiency or the effects of aging on the immune system, impact multiple organ systems, thus therapeutic interventions targeted for one organ system may be beneficial or detrimental to others. Furthermore, the clinical impact of aging may not be consistent across the organ systems, hence targeted interventions for osteoporosis should continue to be warranted in clinical practice since the majority of those at high risk of fracture remain untreated or inadequately treated.

Epidemiologic studies, access to large data sets like UK Biobank, and reassessment of earlier large trials give us insights into the potential value of drug targets of the past, like estrogen-based hormone replacement, calcitonin, and beta-blockers. New methods of drug delivery have or are being evaluated using currently available molecules such as oral PTH 1-34 and transdermal abaloparatide, though differences in the pharmacokinetic profiles seem to provide pharmacodynamic effects which differ from subcutaneous administration. Biosimilars such as denosumab biosimilar (CP-T41) will soon be available. These offer potentially more affordable therapies for those suffering for osteoporosis.

Clinical syndromes such as osteo-sarcopenia, and sarcopenic obesity, and the current use of gastric bypass surgery and the impact of expanded use of incretins give us insights into potential drug targets. Our greater understanding of myokines, osteokines, and adipokines provide biological plausibility to these inter-organ relationships. The strong correlation of aging to bone fragility gives us additional potential ways to increase bone formation and attenuate bone loss. Bone specific senescence-associated secretory phenotype cells (SASP) and their impact on neighboring cells will be reviewed.

Finally, the genetics revolution, with data from large population cohorts or family-based studies remain an attractive source of drug targets. Furthermore, advances in the antibody platforms to include targeting two or more offending proteins allow greater versatility and potentially improve benefit-risk profiles for molecules in development. However, at this time, the ability to identify older individuals at highest risk of fracture through polygenic risk scores or other genetic markers seems limited.

OPENING3

HIGHLIGHTS OF THE GALLERIA BORGHESE

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The Galleria Borghese stands as one of the most extraordinary art collections in the world, housed within a 'villa of delights' designed to showcase its prestigious holdings. Established under the patronage of Cardinal Scipione Caffarelli Borghese (1577–1633) during the papacy of Paul V Borghese (1605–1621), the collection rapidly grew to become one of the most significant of its time. Through strategic acquisitions and an ambitious architectural vision, Scipione assembled an unparalleled array of masterpieces.

The Museum today displays works by some of the most renowned artists of the Renaissance and Baroque periods, including Gian Lorenzo Bernini, Caravaggio, Raphael, Titian, and Antonio Canova, among others. It holds the most important collection of Bernini's sculptures and a remarkable selection of Caravaggio's paintings, alongside ancient sculptures, bas-reliefs, and mosaics. The collection is presented in its original setting across twenty ornately decorated rooms, offering an immersive experience that reflects its historical grandeur.

This presentation explores the unique history, artistic significance, and curatorial approach of the Galleria Borghese, shedding light on its role in preserving and celebrating a heritage of exceptional artistic value.

WCO IOF-ESCEO

2025 ROME

WORLD CONGRESS ON OSTEOPOROSIS, OSTEOARTHRITIS AND MUSCULOSKELETAL DISEASES

Abstract Book

Oral Presentations Abstracts

OP1 - P815

OBESITY IS RELATED TO POORER FUNCTIONAL OUTCOMES AMONG INDIVIDUALS WITH RADIOGRAPHIC KNEE OSTEOARTHRITIS: FINDINGS FROM THE HERTFORDSHIRE COHORT STUDY

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Objective: Osteoarthritis is the most common joint condition, with obesity an established risk factor. Although osteoarthritis patients are advised to maintain a healthy weight, this is often challenging, especially when pain limits activity. We examined relationships between obesity and functional outcomes in older community-dwelling adults with radiographic knee osteoarthritis.
Material and Methods: We studied 101 men and 115 women, aged 71-80 years, from the UK Hertfordshire Cohort Study. Participants completed a questionnaire that ascertained information on health-related quality of life (EuroQol-5D) and pain according to the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Knee radiographs were taken and classified according to Kellgren and Lawrence (K&L) criteria; analysis was restricted to individuals with radiographic knee osteoarthritis (K&L score ≥2 on either knee). Balance, walking and chair rise scores were assigned, depending on performance, and used to derive the Guralnik physical performance score. Binary and ordinal logistic regression were used to examine obesity status in relation to functional outcomes after adjustment for age and sex.
Results: Prevalence of obesity (BMI≥30kg/m^2) was 26.7% among men and 44.3% among women. Odds of having a higher Guralnik score were lower among obese participants compared to those who were not obese (p<0.001). Being obese was associated with greater odds of reporting at least some problems in the following EuroQol domains compared to those who were not obese: mobility (odds ratio [95% CI]: 4.73 [2.52, 8.85], p<0.001); self-care (3.40 [1.44, 8.02], p=0.005); usual activities (4.38 [2.31, 8.30], p<0.001); and pain (2.27 [1.24, 4.15], p=0.008). Obesity was also related to increased odds of having a WOMAC pain score > 0 (2.21 [1.24, 3.95], p=0.007).
Conclusions: These findings highlight the strong relationships between obesity and functional outcomes in community-dwelling older people with radiographic knee osteoarthritis, and reinforce the need for support to achieve appropriate weight management.

OP2 - P700

DRIVING KNEE OSTEOARTHRITIS STRUCTURAL PROGRESSOR PROGNOSIS INTO THE NEXT GENERATION: LEVERAGING MACHINE/DEEP LEARNING, MICRORNA AND MAGNETIC RESONANCE IMAGING

A. Jamshidi[1], O. Espin-Garcia[2], T. G. Wilson[3], I. Loveless[3], J.-P. Pellletier[1], S. A. Ali[4], J. Martel-Pelletier[1]

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Objective: Predicting knee osteoarthritis (OA) patients at risk of rapid structural progression remains challenging. Circulating micro-RNAs (miRNAs) showed promise as biomarkers for stratifying such patients. This study aimed to develop a miRNA-based prognosis model to identify knee OA structural progressors using machine/deep learning, with structural progressors defined via a methodology using MRI and X-ray data[1].
Methods: Baseline serum miRNAs from 152 Osteoarthritis Initiative (OAI) participants were isolated, sequenced, and used for model development. Dimensionality reduction was performed to identify the most informative miRNAs within the initial set of 456. Key miRNAs and OA determinants, including age, sex, BMI, and race (Caucasian and African American), were selected after a comprehensive exploration of 7 feature selection machine learning. The final model was developed after extensively exploring an array of machine/deep learning algorithms. The performance of the models was assessed using AUC, accuracy, sensibility, and specificity. Validation employed an independent cohort of 30 OAI baseline plasma samples.
Results: Feature clustering reduced the initial set to 107 miRNAs. Elastic Net was identified as the optimal feature selection model. The final prediction model utilized an Artificial Neural Network (ANN) comprised of age and four miRNAs, hsa-miR-556-3p, hsa-miR-3157-5p, hsa-miR-200a-5p, and hsa-miR-141-3p, and achieved an excellent performance (AUC, 0.94; accuracy, 0.84; sensitivity, 0.89; specificity, 0.75). The ANN model validation analysis confirmed the model's robustness (AUC, 0.81; accuracy, 0.83; sensitivity, 0.71; specificity, 0.94).
Conclusion: This study identifies, for the first time, a microRNA signature capable of predicting rapid structural progression in knee OA patients. The model demonstrated strong performance and was validated in an independent cohort, showcasing its potential for generalization. The translational potential of this prediction model is significant, as it will provide clinicians with a valuable tool for personalized and targeted treatment strategies as well as assist early identification of high-risk structural pro-

gressor patients for inclusion in trials.
[1]Jamshidi A, et al. *Ther Adv Musculoskelet Dis* 2020;12:1-12.

OP3 - P686

EFFECTIVENESS OF PRESCRIPTION GLUCOSAMINE SULFATE (PGS) IN A COHORT OF FILIPINO PATIENTS WITH MILD-MODERATE KNEE OSTEOARTHRITIS (OA)

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Objective

To evaluate the effectiveness of pGS in reducing the severity of pain in patients with mild to moderate knee OA pain.

Materials and Methods

A multicenter, low interventional parallel-group 8-week study in Manila, Philippines recruited participants aged 50-70 years with mild to moderate knee OA(diagnosed using American College of Rheumatology criteria). All patients had baseline Western Ontario and McMaster Universities Osteoarthritis Index(WOMAC) score≥40, a BMI<29.99 and received pGS for 4 weeks. Thereafter patients either remained on monotherapy for a further 4 weeks or had their pain relief supplemented with celecoxib 200 mg OD depending on patient preference and their response to treatment with pGS at 4 weeks. This abstract focuses on the pGS monotherapy arm only. The primary end point was reduction from baseline in knee pain severity at week 8 based on the WOMAC Pain and visual analogue scale(VAS)(0 to 100mm) scores.

Results

Of 324 screened subjects, 281 treated; 244 completed 8 weeks of pGS treatment. At week 8, WOMAC pain scores showed a significant reduction (least square mean (LSM) change of -11.96,P< 0.0001)(Table 1)(Figure 1A). Similarly, VAS scores showed a significant reduction compared to baseline(LSM change of -56.36,P< 0.0001)(Table 1)(Figure 1B).

	Baseline	Week 8
	pGS(n=279)	pGS(n=244)
WOMAN pain score(SD)	13.5(2.63)	1.6(2.10)
WOMAN pain score LSM change		-11.96(95%CI;-12.26 to-11.67)
VAS score(SD)	68.4(10.89)	11.9(12.33)
VAS score LSM change		-56.36(95%CI; -58.05,-54.67)

Table.1: WOMAC pain outcomes mean value(SD) and VAS(SD) score in Full Analysis Set(FAS) population(n=279) with knee OA receiving pGS(1500 mg QD) for 8 weeks

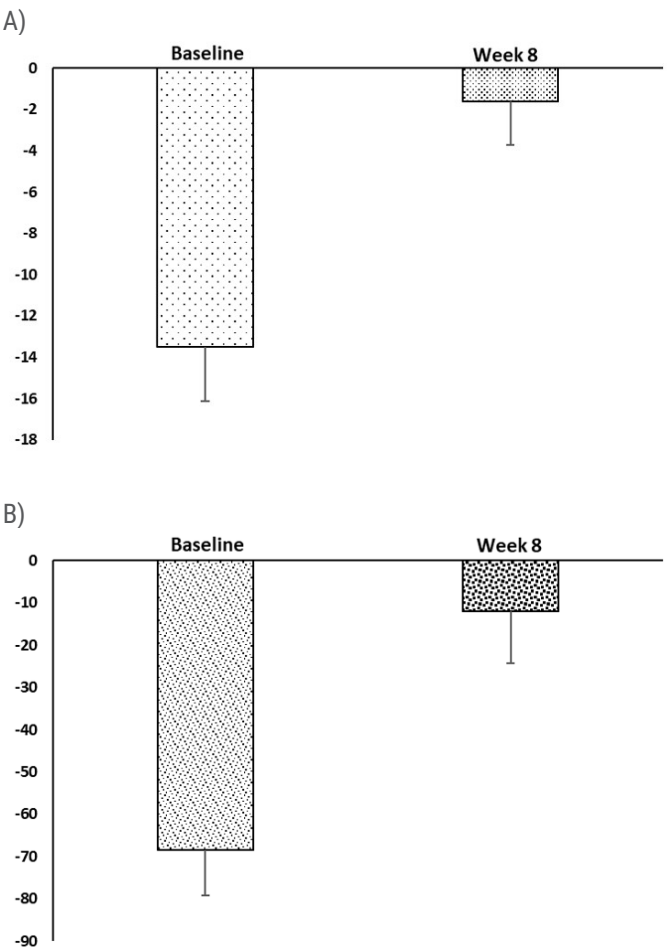

Fig.1: knee OA patients(FAS population,n=279) treated with pGS; A)WOMAC pain index at baseline and week 8(P<0.0001) in knee OA patients treated with pGS; B)VAS score at baseline and week 8(P<0.0001) .

Conclusion

Prescription Glucosamine Sulfate (pGS) demonstrated a significant reduction in knee OA pain in patients with mild to moderate osteoarthritis at the end of 8 weeks.

OP4 – P1138

SAFETY OF ANTI-OSTEOARTHRITIS MEDICATIONS: OUTCOMES OF A SYSTEMATIC LITERATURE REVIEW OF POST-MARKETING SURVEILLANCE STUDIES

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Objective: To identify all the published post-marketing safety surveillance (PMS) studies on anti-osteoarthritis (OA) medications, and to describe the characteristics and the main findings of these studies.

Methods: This study followed the Cochrane guideline for systematic reviews (SR) of interventions. The Medline, CENTRAL, Scopus, and TOXLINE databases were comprehensively searched from inception to November 2023, to include all PMS studies on any anti-OA medications. The outcomes of the review were any adverse events (AEs) reported in the included studies.

Results: From 16,990 records retrieved from literature search, 59 articles were included. Most studies investigated non-steroidal anti-inflammatory drugs (NSAIDs, 27 studies, 28 reports) and intra-articular hyaluronic acid (IAHA, 16 studies). Symptomatic slow-acting drugs for osteoarthritis (SYSADOAs) were assessed in 7 studies, and corticosteroid injections in 4 studies. Opioids and "herbal mixtures and other compounds" each were investigated respectively in 3 and 2 studies. Most studies were cohort studies (n = 44), others were case reports or case series (n = 12), randomized controlled trials (RCTs, 2 reports of a same trial), or case-control study (n = 1). The most commonly reported AEs with NSAIDs from cohort studies, RCTs, and case-control studies were gastrointestinal (GI) and/or cardiovascular (CV) AEs. Where comparisons between NSAIDs were made, the overall literature shows a better or similar safety profile for celecoxib (at a daily dose of 200 mg) compared to other NSAIDs in regards with the GI, CV, and renal events. Other anti-OA medications with most commonly reported AEs were: IAHA (injection site pain); diacerein (GI AEs and reddish urine); avocado–soybean unsaponifiables (GI AEs); non-pharmaceutical grade glucosamine and chondroitin (allergic reactions, GI disorders); opioids (hip fracture associated with long-term tramadol use among older adults; and GI and nervous system disorders with hydrocodone); corticosteroid injections (increased risk of OA progression); herbal mixtures and other compounds (GI AEs). There were case reports or case series of specific AEs with various anti-OA medications that require further investigations in well designed cohort studies before any definitive conclusions.

Conclusions: This SR of PMS studies confirms previous evidence on the safety of anti-OA medications from meta-analyses of phase 3 RCTs. Beyond the findings reported, the limitations of this research highlight the urgent need of a reporting guideline for PMS studies.

OP5 - P553

EFFECT OF TIBOLONE ON CORTICAL AND TRABECULAR BONE IN POSTMENOPAUSAL WOMEN COMPARED WITH ESTROGEN THERAPY

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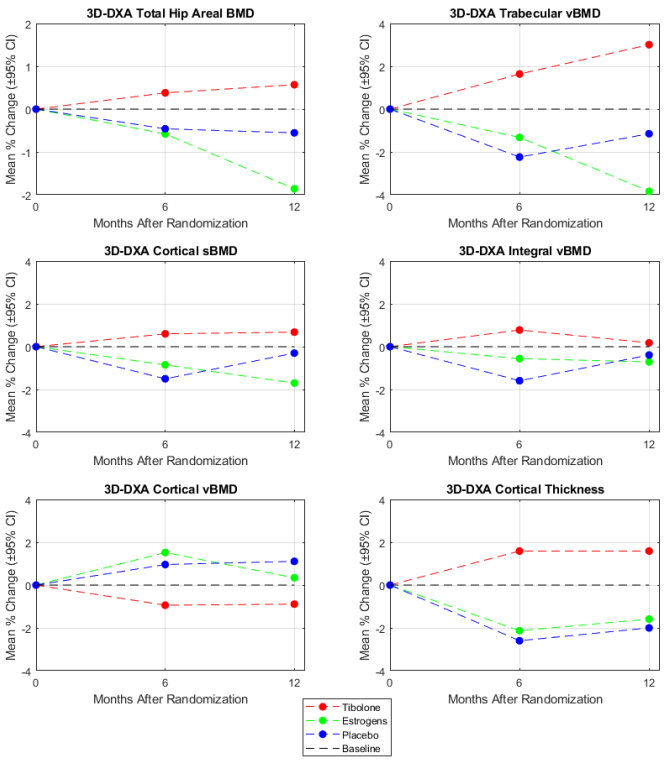
Objective: To evaluate the effects of 2.5 mg/day of tibolone compared to 0.625 mg/day of estrogen and placebo on cortical and trabecular bone in postmenopausal women at 6 and 12 months of treatment.

Material and Methods: A randomized controlled trial was conducted in postmenopausal women from Mexico City. Participants were divided into three groups: A) Tibolone 2.5 mg/day, B) Conjugated estrogens 0.625 mg/day with medroxyprogesterone 5 mg/10 days, and C) Placebo. Hip aBMD was assessed at 6 and 12 months. Cortical and trabecular bone measurements were obtained using 3D modeling from DXA scans (3D-SHAPER v2.10.1, Galgo Medical, Spain). Parameters included cortical vBMD, cortical thickness, cortical surface BMD, and trabecular vBMD. Comparisons between groups were performed for these measurements.

Results: There were 22 participants in the tibolone group, 27 in the estrogen group, and 22 in the placebo group. At 6 months, hip aBMD increased by 0.34% in the tibolone group but decreased by 0.47% and 0.31% in the estrogen and placebo groups, respectively. Comprehensive vBMD increased by 0.77% in the tibolone group and 0.11% in the estrogen group, while it decreased by 1.04% in the placebo group. Trabecular vBMD increased by 1.51% and 0.65% in the tibolone and estrogen groups, respectively, but decreased by 1.5% in the placebo group. Cortical thickness increased by 1.69% in the tibolone group but decreased by 2.17% and 2.75% in the estrogen and placebo groups, respectively. 3D modeling provided valuable insights into whether changes in DXA aBMD were driven by trabecular or cortical compartments, highlighting more pronounced improvements in the tibolone group.

Conclusions: Tibolone therapy demonstrated a trend toward improvement in all parameters, with increases of up to 2% at the 6-month mark. These findings suggest tibolone could be a viable alternative to hormonal therapy, offering similar BMD benefits with fewer adverse effects. Greater improvements are expected with continued treatment at 12 months.

Figure 1. Changes in cortical and trabecular bone measured with 3D DXA.



OP6 - P817

VERTEBRAL FRACTURES IDENTIFIED ON LATERAL DXA IMAGES USING DEEP NEURAL NETWORKS PREDICT INCIDENT FRACTURES IN OLDER WOMEN

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Objective: The aim of this study was to examine if vertebral fractures (VFs) identified on lateral DXA-images, using deep neural networks [1], predict incident fractures to a comparable degree of manually annotated vertebral fracture assessments (VFAs).
Material and Methods: 2,831 women from the SUPERB study were included in this study. VFs (mild to severe) were diagnosed from DXA by VFA or by the novel deep learning method XVFA[1]. Due to image quality, manually annotation was possible for 30,589 vertebrae, while XVFA used all visible vertebrae (n=37,123). Incident fractures were x-ray verified. Cox regression models were used to assess the association between VFs and incident fractures, with adjustments for clinical risk factors and femoral neck BMD.
Results: During 8 years of follow-up 683 and 1,310 women were identified as having any VF when analyzed manually or by XVFA, respectively. Women with any VF verified by the manual method or by XVFA had 327 (47.9%) and 539 (41.1%) any fracture, respectively. With the manual annotation method women with any VF had 70% increased risk of any fracture compared to women without VF. With the XVFA method, women with any VF had 42% increased risk of any fracture, compared to women without VF. These associations remained in adjusted models in both methods (Table 1).
Conclusion: Both methods for identification of VFs, the novel XVFA and manually annotated VFAs, predicted incident fractures.

1.V Wåhlstrand Skärström, L Johansson, J Alvén, M Lorentzon, I Häggström, *Explainable vertebral fracture analysis with uncertainty estimation using differentiable rule-based classification.* https://doi.org/10.48550/arXiv.2407.02926, 2024.

Table 1. Associations between VF identified by VFA manually or by XVFA and fracture risk in older women.

	VF identified manually		VF identified by XVFA	
	No VF n=2148	Any VF n=683	No VF n=1521	Any VF n=1310
Any fracture				
No. (%)	698 (32.5)	327 (47.9)	486 (32.0)	539 (41.1)
HR (95% CI)				
Adjusted for age, height, weight	1 [Reference]	**1.70 [1.49-1.94]**	1 [Reference]	**1.42 [1.26-1.61]**
+ clinical risk factors	1 [Reference]	**1.58 [1.38-1.81]**	1 [Reference]	**1.34 [1.18-1.52]**
+ FN BMD	1 [Reference]	**1.47 [1.29-1.68]**	1 [Reference]	**1.28 [1.13-1.45]**

Associations were examined using cox regression model. Hazard Ratios (HR) and 95% confidence intervals (CI) are presented. XVFA = explainable VFA (a model developed by deep learning).

OP7 - P381

MACHINE LEARNING FOR THE PREDICTION OF FRAGILITY FRACTURES BY BONE AND BODY COMPOSITION PARAMETERS: FINDINGS FROM THE OSTEOLAUS 10 YEARS POPULATIONAL COHORT

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Objectives: Recent reviews highlighted the potential value of artificial intelligence in improving fragility fracture prediction. However, no studies have comprehensively integrated bone and body composition metrics from Dual X-ray Absorptiometry (DXA) in fracture prediction models. We aim to analyse the prediction of fragility fractures using regional and total body DXA assessments using a machine learning pipeline.
Material and methods: 1475 Swiss post-menopausal women (age 64.5±7.6years, body mass index 25.9±4.5kg/m^2) from the Osteo-Laus cohort were followed for 10 years (2010-2022). Parameters of bone health (hip and spine DXA: 34 variables) and body composition (Whole body DXA: 65 variables) were assessed by DXA scans. Vertebral fractures were screened with lateral DXA. Other risk factors (15 variables) and fragility fractures were collected from questionnaires. These parameters were tested separately or combined (114 variables) in different datasets. All datasets were split for training (85%) and testing (15%) with a balanced fragility fractures proportion. Models were trained using logistic regression, multilayer perceptron, random forest, and XGBoost, with hyperparameters optimized through grid search and 5-fold internal cross-validation, to maximize the area under the curve (AUC).

Results: 590 to 957 participants were included in the final complete case analyses, with 237 fragility fractures. Across all models and datasets, the training AUC values ranged from 0.69 to 1.0, while the test AUC values ranged from 0.55 to 0.78. The combination of bone, body composition and fracture risks parameters in the same dataset achieved the best test AUC (0.65-0.78). Logistic regression demonstrated the best balance between performance (AUC 0.78) and generalizability (specificity 0.66, recall 0.69). Other models showed varying trade-offs between overfitting and reduced test performance (eg. XGBoost: AUC 0.72, specificity 0.82, recall 0.25).
Conclusions: These findings emphasize the value of combining DXA-derived bone and body composition parameters for fragility fracture prediction in postmenopausal women. While logistic regression produced the most promising results in this preliminary study, the other models remain at interest for further analysis in combination with image based analysis. Further studies including a comparison with FRAX®, larger sample size and external validation are needed.

OP8 - P485

REMS TECHNOLOGY FOR FRACTURE RISK ASSESSMENT IN KIDNEY TRANSPLANT PATIENTS

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Objective(s): Changes in bone quantity and quality are common consequences in Kidney transplant patient (KTP), who are at a significantly increased risk of fractures. A complex interplay of factors contributes to bone damage in KTPs, including immunosuppressive therapy and alterations in the parathyroid hormone-vitamin D-fibroblast growth factor 23 axis. The high fracture risk in KTPs is associated with increased morbidity, higher healthcare costs, hospitalizations, and mortality. Therefore, due to the substantial burden of this issue, assessing fracture risk and, consequently, implementing targeted early interventions and proper patient management are crucial. The aim of this study is to evaluate the 5-year fracture risk in KTP patients by using the non-invasive Radiofrequency Echographic Multi Spectrometry (REMS) technology.
Material and Methods: The 5-year fracture risk was calculated using a REMS-based algorithm that automatically combines information on both bone quantity and quality. Specifically, by combining the REMS T-score and the Fragility score (figure 1), 7 distinct risk classes are identified, each representing a different fracture risk probability. The R1 category represents the group with the lowest fracture risk probability, which increases progressively up to R7 for the category with the highest risk (figure 2).

Combining Matrix of REMS BMD and Fragility Score

REMS FRAGILITY SCORE Classification	REMS T-SCORE classification: NORMAL	OSTEOPENIA	OSTEOPOROSIS
NORMAL	R1	R3	R5
DECREASED	R2	R4	R6
LOW	R3	R5	R7

Figure 1

Total Fracture Risk at 5 years (‰)

Risk class	Risk of major osteoporotic fracture per 1000 subjects per 5 years
R1	≤ 5
R2	[5-10]
R3	[10-20]
R4	[20-35]
R5	[35-60]
R6	[60-100]
R7	> 100

Figure 2

Results: A total of 30 patients were enrolled (50-80 y; BMI 16-23 Kg/m^2, both genders). All participants underwent a lumbar spine REMS scan (L1-L4) to assess their fracture risk class. The KTPs were all classified into the high-risk categories R5-R6, indicating a 5-year fracture risk for major fractures of more than 60 ‰.
Conclusion(s): In conclusion, REMS technology enables the identification of high-risk individuals. The prevalence of R5-R6 cases in KTPs highlights the need for improved bone health monitoring and prevention strategies to reduce fractures and enhance quality of life.

OP9 - P940

IMPACT OF AI-ENABLED VERTEBRAL FRACTURE (VF) IDENTIFICATION ON FRACTURE LIAISON SERVICE (FLS) KEY PERFORMANCE INDICATORS (KPIS) AND TREATMENT RECOMMENDATIONS VARIES BY FLS

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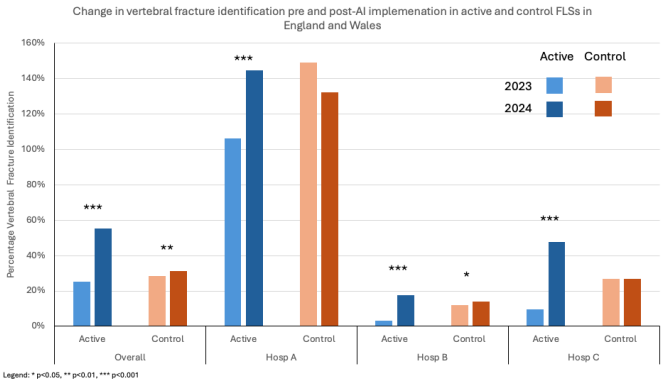
Objectives:
To compare the KPIs of FLSs before and after the introduction of AI-enabled VF identification across FLSs in England and Wales.
Materials and Methods:
The Nanox-AI HealthVCF AI model was implemented in 3 FLSs to identify potential vertebral fractures from existing CT scans with additional funding for FLS administrators and nurses. The KPIs for identification, assessment, treatment recommendation and follow-up were compared before (Jan to Nov 2023) and after (Jan to Nov 2024) AI implementation using the FLS-Database of England and Wales. Each AI-FLS was supported to deliver patient-co-produced Quality Improvement (QI). Up to 4 control FLSs for each AI-FLS were identified, matching on spine fracture identification KPI in 2023 to account for secular changes. Differences in proportions were compared using two-proportion z-tests.
Results
While overall VF identification doubled from 25.1% (2023) to 55.4% (2024), p<0.001, there were marked differences between AI-sites (Figure). Non-AI Control sites demonstrated a smaller increment in VF identification from 28.6 to 31.3% (p=0.007) which was inconsistent across sites. The change in KPI for VF patients varied by AI-FLS. Time to assessment significantly worsened in Hosp B and C but remained stable in Hosp A. DXA within 12 weeks worsened in Hosp B (85.7% to 66.7%) and Hosp C (92.3% to 80.6%) with little change in Hosp A (96.8 to 94.9%). The proportion of patients who were recommended treatment remained unchanged except for Hosp C, where it worsened from 85.2 to 71.4% (p=0.01).
For non-vertebral fracture (NVF) patients in AI-FLSs, time to assessment worsened in Hosp A & C (p<0.03) but improved in Hosp B. DXA within 12 weeks did not significantly change except for Hosp C where it improved (91.9% to 96.6%, p=0.02). The treatment recommendation rate for NVF significantly improved in Hosp B and C (p<0.003) and was unchanged in Hosp A.
Conclusion
As expected, AI implementation significantly improved VF identification but had differential effects on the KPI for VF and NVF between the AI-FLSs despite a focus on QI. These findings highlight the importance of enhancing QI when implementing AI-enabled VF identification in the FLS setting.



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Disclosures
Baxter: Honoraria: Nuffield Health
Boylan:Honoraria: UCB
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Connor: Honoraria: Amgen, Thornton & Ross, UCB
Curtis: Honoraria: Amgen, Eli Lilly, Pfizer, Thornton & Ross and UCB
Eckert: Honoraria: UCB
Javaid: Grants: UCB, Kyowa Kirin; Honoraria: UCB, Amgen, Kyowa Kirin, Nanox-AI, Naitive Technologies, Theramex, Thornton-Ross
Kimmel: Employee of Nanox-AI
Pinedo: Honoraria: UCB, Mereo
Sahota: Honoraria: UCB, Pharmacos
Threlkeld: Honoraria: UCB
Turton: Honoraria: Amgen, Lily; Grant: Amgen

OP10 - P724

TRENDS IN HIP FRACTURE INCIDENCE IN ENGLAND BEFORE, DURING, AND AFTER THE COVID-19 PANDEMIC (2014-2023)

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Objective
To investigate recent trends in hip fracture incidence in England before, during, and after the COVID-19 pandemic.
Methods
An epidemiological population-based study was conducted of all first-time emergency hip fracture hospital admissions unrelated to high-energy trauma in adults aged ≥ 60 years using English national secondary care data with linked national death records from January 2014 to December 2023. Temporal trends in age-standardized incidence rates were investigated by sex using national mid-year population estimates. Joinpoint regression models with permutation tests were used to calculate monthly percent changes with 95% confidence intervals (MPCs, 95% CIs).
Results
From 2014 to 2023, there were 429,499 hip fracture admissions in women, and 187,566 in men. Age-standardised incidence rates

steadily declined from 2014 to 2020, from a mean monthly rate of 20.1 to 17.6 cases per 100,000 men, and from 33.2 to 27.7 cases per 100,000 women (MPC in men: -0.17%, 95% CI: -0.23 to -0.11; MPC in women: -0.23%, 95% CI: -0.28 to -0.18). The direction of the trend changed in February 2021 in men and women, after which rates remained relatively flat (MPC for men: 0.14, 95% CI: -0.07 to 0.35; MPC for women: 0.13%, 95% CI: -0.05 to 0.31; p for slope change < 0.01 for both). By 2023, mean monthly incidence rates were 17.7 cases per 100,000 men and 28.2 cases per 100,000 women. The incidence of hip fracture was higher in women than in men (IRR 1.62, 95% CI: 1.61 to 1.64), but temporal trends were broadly consistent in both sexes.

Conclusion

This study highlights a downward trend in hip fracture incidence rates from January 2014 to February 2021 in England, followed by a sudden plateau from February 2021 onwards in men and women. Further investigation is needed to understand the cause of this change. Continued surveillance is needed to inform planning of emergency hip fracture care services and to measure the effectiveness of prevention strategies, particularly in the context of ongoing disruption and reorganisation of healthcare services in the UK.

Figures

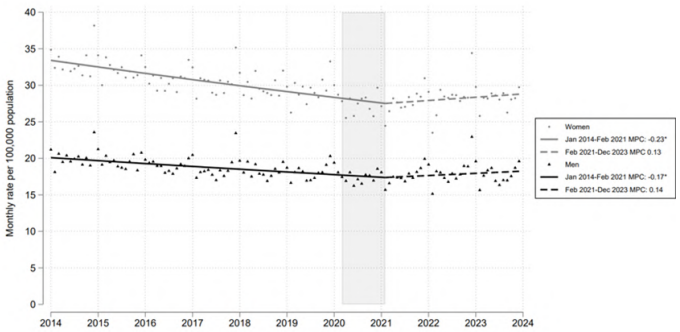

Figure 1: Age-standardised hip fracture incidence rates in England by sex, January 2014 to December 2023. *Indicates significance (p<0.05). MPC: monthly percentage change. The shaded area indicates a period of COVID-19-related public health restrictions.

Disclosures

None.

OP11 - P1425

EVALUATING THE PRAGMATISM OF SARCOPENIA CLINICAL TRIALS USING PRECIS-2: A SYSTEMATIC REVIEW

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Objectives:
This study aims to review interventional clinical trials in sarcopenia to assess their level of pragmatism and identify gaps to improve the clinical relevance and feasibility of future trials in the real world.
Material and Methods:
A systematic review was conducted using MEDLINE (via Ovid), Embase, and Cochrane Central Register of Controlled Trials (PRISMA guidelines; PROSPERO: CRD42024571027). Eligible studies included randomized controlled trials (RCTs) on sarcopenia treatment using a consensus definition. The PRECIS-2 tool was used to assess the level of pragmatism of these RCTs across nine standard domains (eligibility, recruitment, setting, organisation, flexibility of delivery, flexibility of adherence, follow-up, primary outcome, and primary analysis), with an additional "control" domain. Total PRECIS-2 scores were calculated, and subgroup analyses were conducted by intervention type, geographical location, sample size, study duration, and sarcopenia definition.
Results:
Of the 3,985 references reviewed, 58 RCTs met the inclusion criteria. The mean PRECIS-2 score across its 10 domains was 2.92 (SD 1.30), reflecting a balance of explanatory and pragmatic characteristics. Organisation, recruitment, and primary outcome were identified as the most pragmatic domains, whereas eligibility, adherence, and follow-up were the most explanatory. Subgroup analyses revealed that geographical location and sarcopenia definitions impacted significantly the overall PRECIS-2 score. More precisely, studies conducted in Asia achieved higher pragmatism scores, with significant differences in setting (p = 0.016), follow-up (p = 0.009), and control (p = 0.011). Studies using Asian sarcopenia criteria (e.g. AWGS) were also more pragmatic, particularly in the setting (p = 0.036) and control (p = 0.010).
Conclusion:
Due to the reversible nature of sarcopenia, clinical trials in this area have increased significantly in recent years. Although some methodological aspects of these RCTs follow pragmatic approaches, this systematic review highlights the need for improvements in areas such as exclusion criteria, follow-up and adherence. Specifically, there is an urgent need to design RCTs that more accurately reflect the complexity of real-world interventions in the multifaceted landscape of sarcopenia.
Disclosures: The authors have no conflicts of interest to declare.

OP12 - P1387

REFINING EARLY DETECTION OF LOW BONE MINERAL DENSITY: A DEEP LEARNING MODEL FOR OSTEOPENIA SCREENING USING CHEST RADIOGRAPHS

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Objective(s): We developed and validated a deep learning model to classify osteoporosis, osteopenia, and normal bone mineral density (BMD) from standard frontal chest radiographs. This framework offers finer categorization, enabling earlier identifica-

tion of osteopenic individuals and more timely DEXA referrals for those at moderate risk.

Materials and Methods: We expanded our PROS CXR:OSTEO product—which initially achieved high accuracy (AUC = 0.94 in internal validation) in classifying osteoporosis versus non-osteoporosis—to further differentiate osteopenia from normal within the non-osteoporosis category. Training data comprised 46,048 chest radiographs from Hospital A (South Korea), categorized by DXA T-scores, augmented with 16,265 unlabeled images from public datasets, totaling 62,313. For internal validation, 1,989 chest radiographs from Hospital A were used. For external validation, we collected datasets from three independent institutions spanning secondary healthcare (Hospital B), a facility serving veterans (Hospital C), and a global platform (Platform D).

Results: Our framework achieved an AUC of 0.93, sensitivity of 0.94, and specificity of 0.72 in classifying normal and osteopenia on External A (88.9% female; mean age 59.0 years), an AUC of 0.83, sensitivity of 0.78, and specificity of 0.82 on Hospital B (55.5% female; mean age 59.3 years), an AUC of 0.83, sensitivity of 0.73 and specificity of 0.67 on Hospital C (44.8% female; mean age 73.6 years), and an AUC of 0.78, sensitivity of 0.75, and specificity of 0.77 on Platform D (95.4% female; mean age 67.2 years).

Conclusion(s): Our model effectively classified osteopenia from normal BMD within the non-osteoporosis category, helping identify individuals at risk of reduced bone density and potentially enabling earlier intervention for osteopenia and osteoporosis.

OP13 - P147

CALCIUM ISOTOPE RATIOS IN SERUM INFORM ON SKELETAL CALCIUM BALANCE IN PATIENTS ON DIALYSIS

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Dysregulated mineral homeostasis in chronic kidney disease (CKD) can cause bone demineralization and an increased risk of fractures. In both healthy individuals and patients with advanced kidney failure, the ratio of naturally occurring non-radioactive calcium (Ca) isotopes 44Ca/42Ca in serum (Calcium isotope marker: CIM_Serum), serves as quantitative indicator of bone Ca balance (BCaB). Preferential incorporation of the lighter 42Ca isotope into bone elevates CIM_Serum during periods of net bone formation and reduces it when bone resorption predominates. In this study we measured the Ca isotope composition in bone biopsies (CIM_Bone) to determine the sensitivity of CIM_Serum in estimating BCaB. Nineteen patients receiving chronic dialysis (median age 60 years, time on dialysis 3.3 years) underwent Dual Energy X-ray Absorptiometry (DXA) and bone biopsies at the time of kidney transplantation. CIM_Serum and CIM_Bone was measured simultaneously in serum and bone biopsies. After adjustment of all study participants for the uptake of Ca supplements and renal impairment, we compared the results to those with a control group of ten adults with osteoporosis only. Results show that both CIM_Serum and CIM_Bone were significantly lower in the dialysis patients cohort than in the osteoporosic control. In the osteoporosis group, CIM_Serum correlated strongly with CIM_Bone ($p=0.0018$, $R^2=0.72$). A positive, albeit weaker, correlation was also observed in the dialysis group ($p=0.005$, $R^2=0.37$). CIM_Serum and CIM_Bone correlated positively with osteoblastic markers BAP and PINP, and inversely with PTH. While only 31% had DXA T-scores below -2.5 defining osteoporosis, CIM_Serum indicated severe bone mineral depletion in 89% of subjects. Histologic analysis revealed that CIM_Bone correlated positively with trabecular thickness and mineralized area, and inversely with osteoid area. Multiple regression analysis identified CIM_Bone ($\beta=0.88$, 95% CI -1.31 to -0.29, $p<0.001$), BALP ($\beta=0.63$, 95% CI 0.19 to 0.41, $p=0.008$), and osteoid area ($\beta=-0.31$, 95% CI -1.24 to -0.16, $p=0.03$) as significant predictors of CIM_Serum, collectively accounting for 87% of its variability. In conclusion, CIM_Serum is a significant and independent predictor of BCaB in dialysis patients, correlating strongly with CIM_Bone provides a comprehensive, real-time assessment of bone health, potentially enhancing the clinical evaluation of CKD-associated bone disease.

OP14 - P1025

ASSOCIATIONS BETWEEN BODY COMPOSITION, EXERCISE, DIET, SHORT-CHAIN FATTY ACIDS, AND BONE LOSS IN EARLY POSTMENOPAUSAL WOMEN

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Objective

The early postmenopausal period is characterized by a rapid loss in bone mineral density (BMD), which emphasizes the importance of lifestyle factors as important predictors and targets for preventive interventions. This study aimed to assess the relationship between bone characteristics and factors like nutrient intake, body composition, physical activity, and plasma SCFAs; and to identify

which of these factors predict changes in bone characteristics over 2 years in early postmenopausal women.
Material and Methods
This cross-sectional and longitudinal study involved 223 early postmenopausal Swedish women aged 50 to 60 years who participated and completed the 2-year ELBOW II clinical trial. Appendicular lean mass (ALM), fat mass (FM), and BMD were measured using dual x-ray absorptiometry (DXA), and tibia total volumetric BMD (vBMD) and microstructure by high-resolution peripheral computed tomography (HR-pQCT). Additionally, dietary intake, physical activity levels, and plasma short-chain fatty acids (SCFAs) were evaluated.
Results
In multiple linear regression analyses, weight and body mass index (BMI) were significant predictors for all bone parameters. ALM and FM were associated with BMD, with the strength of these associations varying by bone site. Over the 2-year period, the relative change (Δ) in ALM had a stronger association with bone changes than ΔFM. Women in the lowest tertile of ΔALM (ΔALM: -3.5 kg) and baseline FM (FM: 16.5 kg) experienced approximately 2.7-fold and 4.4-fold significantly greater reductions in total hip BMD and tibia total vBMD, respectively, compared to those in the highest tertiles. No consistent associations were observed for changes in neither macronutrient intake nor physical activity and the degree of bone loss. A positive relationship was found between Δisobutyric acid levels and bone loss, suggesting that gut microbiota metabolites may influence bone health.
Conclusion
Women with greater FM and maintaining/increasing ALM are linked to less development of skeletal fragility, typically seen in early postmenopausal women.

Acknowledgments: Chalmers Mass Spectrometry Infrastructure and the SciLifeLab Metabolomics platform provided support with metabolite

OP15 - P144

CALCIUM ISOTOPES AS A NOVEL BIOMARKER FOR VASCULAR CALCIFICATION IN CKD: IMPLICATIONS FOR OSTEOPOROSIS MANAGEMENT

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Calcium balance is intricately linked to both bone health and vascular health. In chronic kidney disease (CKD), abnormal calcium metabolism contributes significantly to the development of vascular calcification, a major cardiovascular risk factor. While osteoporosis is a common comorbidity in CKD, the impact of vascular calcification on bone health remains an area of active investigation.
This study explored the potential of calcium isotope analysis as a non-invasive biomarker for vascular calcification in CKD patients. A cohort of 78 participants, including healthy controls, CKD patients, and those on dialysis, underwent comprehensive assessments, including vascular function tests and serum biomarker analysis.
Results demonstrated significant differences in serum calcium isotope compositions across the groups ($p<0.01$). Receiver operating characteristic (ROC) curve analysis revealed high diagnostic accuracy for serum Ca isotopes in detecting medial calcification (AUC = 0.818, $p<0.01$).
These findings have important implications for osteoporosis management in CKD patients. Accurate assessment of vascular calcification may provide valuable insights into systemic vascular health and may be a useful marker in identifying individuals with CKD at potentially increased risk for adverse health outcomes, including fractures. The use of calcium isotope analysis offers a promising approach for early detection and monitoring of vascular calcification in this vulnerable population. Further research is warranted to investigate the potential interplay between vascular calcification and bone health in CKD, and to explore the clinical utility of calcium isotope analysis in improving osteoporosis management outcomes.

OP16 - P776

FILLING GAPS IN TELEREHABILITATION: VALIDATING REMOTE SYNCHRONOUS AND ASYNCHRONOUS ASSESSMENTS OF PERFORMANCE-BASED OUTCOMES

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Objective: This study assessed the agreement between three methods of performance-based outcome data collection for the 4-Meter Walk (4MW), Timed Up and Go (TUG), and Five-Repetition Sit-to-Stand (5XSTS) tests.
Materials and Methods: Fifty-eight participants were randomized into six groups, completing assessments in different sequences for in-person, remote synchronous, and remote asynchronous assessments of the 4MW, TUG and 5XSTS. In-person assessments served as the gold standard and were repeated five times to capture natural variability of the assessment; remote assessments were performed twice. Participants self-timed remote assessments. Participants were supervised in the remote synchronous assessment and were unsupervised during the remote asynchronous assessment. Agreement was analyzed using the extended Bland-Altman method accounting for repeated measurements, with limits of agreement (LOA) calculated as the mean difference ± 1.96 standard deviations.
Results: Participants were on average 40 years old (range 19–86), confident using technology (97%), held at least a bachelor's degree (83%), managed a medical condition (40%), and managed at least one active pain complaint (12%). After excluding three

statistical outliers, remote synchronous and asynchronous assessments agreed with in-person assessments across all outcomes, with no significant differences in timing. Including outliers, agreement was observed only for the 4MW. Asynchronous TUG demonstrated the largest mean bias (3.31 seconds, 95% CI [2.62, 4.01]). Agreement diminished for tasks requiring more time to complete. Notably, the three outliers were among the study's oldest participants.
Conclusion: Telerehabilitation is a viable management approach. This study shows that in-person, remote synchronous, and asynchronous methods of assessing performance-based outcomes are interchangeable for most participants but require further validation among older adults. This may have reflected the dual-task nature of the remote assessments. Our findings support the use of select performance-based assessments in virtual environments among most participants studied. This research addresses critical gaps in remote physical performance assessment as health providers transition to greater use of telehealth.

OP17 - P736

THE FIRST COMPARISON OF HIP FRACTURE INCIDENCE ACROSS 4 COUNTRIES IN AFRICA

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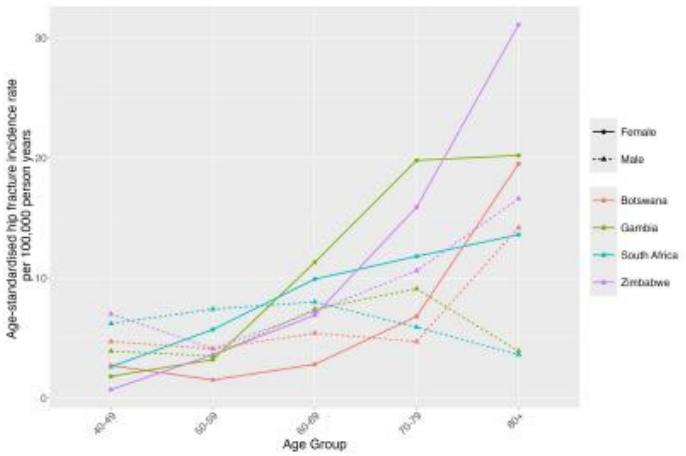
Objectives: To determine age and sex specific hip fracture incidence rates in adults age ≥40 years in The Gambia, West Africa and compare with those from other African countries.
Methods: All hip fracture cases in adults aged ≥40 years, presenting to a hospital or traditional bone setter (TBS) in the study area over 2-years, were identified. Age- and sex- specific hip fracture incidence per 100,000 person-years were estimated using the 2024 Gambian Population census. Incidence estimates were compared between The Gambia, Zimbabwe[1], South Africa[2] and Botswana[3]. Future hip fracture numbers were estimated to 2054 using UN population projections.
Results: Over 2-years, 238 (67% female) patients, mean(SD) age 71.3(12.5) years, presented to hospital (197[82.8%]) or TBS (37[15.5%]). Most reported fragility fractures (217[91.2%]). Presentation >2 weeks after injury was common (70[29.4%]). Incidence rates in The Gambia were 28.0 and 56.2/100,000 person-years for men and women respectively. Hip fractures numbers are predicted to nearly quadruple, from 175 in 2024, to 656 in 2054.
Age-standardised hip fracture incidence rates were broadly comparable between The Gambia, Zimbabwe, Botswana, and the Black South African population (Figure-1). All countries see higher incidence in men than women until age >50 years. The highest incidence rates in women age 60-74 years were in The Gambia, and in women age >75 years in Zimbabwe.
Conclusions: These are the first hip fracture incidence data from West Africa. Fragility fractures in Gambian adults were common, indicative of age-associated osteoporosis. Across the 4 countries, hip fracture cases are predicted to at least double over coming decades; in The Gambia they will quadruple. Healthcare systems now need to pivot to provide fracture services for ageing populations.
References: [1]Wilson BMJ Global Health 2025; [2]Dela Bone 2020; [3]Kebaetse Arch Osteo 2021



OP18 - P498

DIFFERENTIAL ANALYSIS OF LUMBAR SPINE BONE MINERAL DENSITY AND TRABECULAR BONE SCORE IN HYPOPHOSPHATASIA PATIENTS WITH BIALLELIC VS MONOALLELIC ALPL GENOTYPE

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Objective Hypophosphatasia (HPP) is a genetic disorder marked by deficient Alkaline Phosphatase activity. Depending on genotype severity, this causes multiple extraskeletal manifestations and impaired bone mineralization. Dual-energy X-ray absorptiometry (DXA), which measures bone mineral density (BMD), has limitations in assessing bone quality in conditions like HPP, Trabecular bone score (TBS), derived from DXA images, enables an advanced evaluation of vertebral bone microarchitecture and mineralization homogeneity, to offer additional insights into bone quality in such conditions. This study aimed to compare lumbar spine BMD and TBS parameters in HPP patients with biallelic vs monoalleic ALPL variants.

Materials and Methods In this retrospective, single center, matched-pairs analysis, lumbar spine DXA scans from 90 HPP patients with biallelic (n=45) vs monoallelic (n= 45) ALPL variants an no previous enzyme replacement therapy , were analyzed. Lumbar spine (L1-L4) BMD and TBS [version 3 (body mass index- adjusted) and version 4 (tissue thickness adjusted)] were assessed.
Results Overall average values for age (49.6±14.0years), height (166.5±10.6cm), weight (74.5±17.4kg), BMI (26.9±6.0kg/m²) and tissue thickness (19.3±3.1 cm) were not significantly different between the groups.. Mean LS-BMD T-scores was normal (+0.1±2.3) but patients with biallelic variants had higher BMD (+0.88±2,22) than heterozygously affected patients (-0.70±2.06; p<0.001). Conversely, TBS T-scores were low in both cohorts 1.10 (±1.73) vs -1.48 (±1.60) for biallelic vs. monoallelic genotype, respectively (p=0.074). The more recent TBS software version 4 appeared even more sensitive to detect deterioration in both groups, with TBS T-scores of -1.40 (±1.17) vs -1.73 (±1.34) in the two groups respectively (p = 0.64).
Conclusions In line with previous findings, this study indicates that conventional DXA-BMD may appear erroneously high in HPP patients, particularly in more severe biallelic cases where elevated BMD T-scores may mask skeletal defects. Extended analysis using TBS exhibited inferior bone microarchitecture and mineralization inhomogeneity in both, biallelic and monoallelic HPP genotypes. This underscores potential added value of TBS in evaluating skeletal involvement in HPP with the newer version 4 showing greater sensitivity.

OP19 - P538

WHICH THRESHOLD VALUES OF CROSSLAPS TO TARGET TO PREVENT BONE LOSS AT 1 AND 2 YEARS AFTER DENOSUMAB DISCONTINUATION. THE REOLAUS STUDY

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Objective
After denosumab discontinuation (DD) elevated serum crosslaps (sCTX) is associated to bone mineral density (BMD) loss over a two-year period. Bisphosphonates reduce this rebound effect, especially if sCTX remain low. The objective was to define an sCTX threshold below which BMD gained on denosumab is maintained.
Material and Methods
Postmenopausal women receiving ≥2 consecutive denosumab doses and followed ≥2 years after DD with regular BMD and several sCTX measurements were included retrospectively. Lumbar spine (LS) T-score loss ≥0.2 SD defined the losers group. Linear regression analysis and ROC curves were performed to define sCTX threshold (in %ULN, upper limit of the norm; 573ng/l in our laboratory) preventing 1- and 2-year LS BMD loss.
Results
161 women received 8.0±2.9 injections; 50% were defined as losers 2 years after DD. Losers received more denosumab injections (9.0±2.8 versus 7.3±2.9, p=0.002). BMD at DD were similar at all sites in stable and losers groups. LS T-score decreased in losers after 1 (-0.38±0.40 versus -0.09±0.36 SD, p<0.001), and 2 years (-0.49±0.31 versus +0.09±0.25 SD, p<0.001). After 2 years, losers had lower LS T-score (-2.26±1.30 versus -1.75±1.10 SD, p=0.025). Two years after DD, BMD loss was highly correlated with sCTX increase during the first and during the two years on linear regression models (p<0.001). The best sCTX threshold sensitivity-specificity relationship to avoid LS BMD loss at 1 year and over 2 years was 69.3 (397.1ng/l) and 63.8 (365.6ng/l) %ULN, respectively; 32.2 (184.5ng/l) and 35.5 (203.4ng/l) %ULN respectively for a 100% sensitivity (ROC AUC 0.686 and 0.678). sCTX threshold during the first year to avoid LS BMD loss at 2 years was 49.1 (281.3ng/L) and 22.5 (128.9ng/L) %ULN for a 100% sensitivity (ROC AUC 0.674). More patients received ≥3 zoledronate infusions in the losers group (28% vs 7%, p=0.006).
Conclusions
sCTX level during the first year after DD predict 1- and 2-year BMD loss at LS. Strategy to maintain low sCTX level during this first year and regular sCTX monitoring are needed to avoid BMD loss. Maintaining sCTX below 49.1 %ULN during the first year prevent LS BMD loss at 2 years. Shorter denosumab treatments are encouraged. Despite high doses of bisphosphonates, it is not always possible to reach this target.

OP20 - P1044

ABALOPARATIDE INCREASES DISTAL FEMUR BMD POST TOTAL KNEE ARTHROPLASTY

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Objectives: Osteoporosis is common in total joint replacement patients and increases risk for adverse outcomes. Existing data indicate that total knee arthroplasty (TKA) leads to rapid distal femur bone loss. We hypothesized that abaloparatide (ABL) would mitigate this loss. The study's purpose was to evaluate the effect of ABL begun prior to TKA on distal femur BMD.
Materials and Methods: Female and male TKA candidates age ≥ 55 yrs were enrolled in this open-label 18-mo study. Those with clinical osteoporosis, defined as T-score ≤ -2.5 or < -1.0 if prior low-trauma fracture, received daily ABL. Subjects with osteopenia, but without fracture, comprised an untreated control (CON) group. BMD was measured by DXA at the L-spine, total hip, radius and 2 distal femur regions of interest (ROIs) placed at 15% and 25% of femur length at screening (~3 mo pre-TKA), 1-week pre-TKA, 6-mo and 15-mo post-TKA. Groups were compared at baseline by t-test. For this completers analysis (n = 21 ABL/27 CON) BMD change at all measured sites was assessed by ANOVA.
Results: At baseline (n = 58; 29 ABL/29 CON) sex, mean (SD) age

and BMI did not differ between ABL and CON groups; 3 vs. 6 male, 70.5 (7.2) vs. 68.6 (7.1) years and 31.3 (6.1) vs. 31.0 (4.7) kg/m^2 respectively. ABL group baseline BMD was lower ($p \leq 0.05$) at all sites except the L-spine. ABL was dosed for 96 (60) days prior to TKA. In the CON group, BMD declined ~1-2.5% ($p < 0.05$) at the 15% and 25% ROI by 15-mo post TKA.

Distal femur BMD increased at the 15% and 25% sites in ABL group from baseline and differed from CON ($p < 0.05$) at pre-surg, 6 and 15 mo post-surg (Table). L-spine and total hip BMD also increased by 6-mo in the ABL group (Table). BMD percent change at 15% and 25% distal femur ROIs was ~double in the surgical compared to non-surgical leg, (up to 4%; $p > 0.05$), but did not differ at the total hip.

Conclusion: In osteoporotic TKA recipients, ABL increased BMD at the distal femur, L- spine and total hip compared with osteopenic controls. Abaloparatide improves BMD in osteoporotic patients undergoing TKA. The decrease in distal femur BMD after TKA among controls was less than previously reported, thus, further study to clarify the effect of TKA on distal femur BMD is needed.

BMD % Difference from Baseline Between ABL and CON Groups

	Pre-Surg			6-mo			15-mo		
	Abl	Cont	Diff	Abl	Cont	Diff	Abl	Cont	Diff
L1-4	2.4	0.9	1.5*	6.2	1.4	4.8§	11.7	2.6	9.1§
Total Hip	3.1	0.1	3.0*	4.0	-1.6	5.6§	6.2	-1.1	7.3§
0.3 Radius	0.7	0.0	0.7	-1.3	-1.0	-0.3	-3.0	-0.8	-2.2*
15% DF	1.4	-0.5	1.9	9.1	2.3	6.8§	8.5	-1.0	9.5§
25% DF	0.7	-0.1	0.8	3.1	-1.6	4.7†	3.9	-2.4	6.3§

Abl = abaloparatide; Cont = Control; Diff = Difference; DF = distal femur

* = $p \leq 0.05$; † = $p \leq 0.01$ and § = $p \leq 0.001$

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Abstract Book

Oral Communications Abstracts

OC1

AGA2118, A BISPECIFIC MONOCLONAL ANTIBODY NEUTRALIZING BOTH SCLEROSTIN AND DKK1, INCREASED BONE FORMATION, DECREASED BONE RESORPTION, AND LED TO RAPID BMD GAINS IN A FIRST IN HUMAN, SINGLE- AND MULTIPLE- DOSE, PLACEBO-CONTROLLED, RANDOMIZED STUDY

B. L. Langdahl[1], M. T. Drake[2], Y. L. Zhang[3], J. Z. Ke[3], Y. F. Li[3], M. Lankachandra[3], A. C. Zovein[3], H. Z. Ke[3], W. H. Dere[3], R. E. Dent[3]

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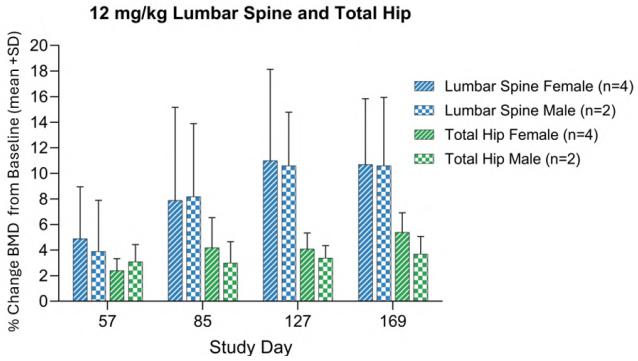
Objective: Sclerostin (Scl) and Dickkopf-1 (DKK1) are key negative regulators of Wnt signaling in bone. AGA2118 is a humanized bispecific monoclonal antibody that neutralizes both Scl and DKK1, thereby increasing bone formation. In this first-in-human study, AGA2118 was administered to men and postmenopausal women to assess safety, tolerability, pharmacokinetics (PK), and pharmacodynamic (PD) effects on biomarkers and BMD.

Methods: In this Phase 1, randomized, double-blind, placebo-controlled, single, and multiple ascending dose (SAD/MAD) study, healthy male (n=13) and female (n=77) subjects received AGA2118 or placebo (6:2) either subcutaneously (SC) or intravenously (IV). SAD cohorts received 0.3, 1, 3, 10, or 15 mg/kg SC, or 0.3 or 3 mg/kg IV, while MAD cohorts received 1, 3, 6, or 12 mg/kg SC every 4 weeks for 3 doses. Subjects were followed for 85 days (SAD) and 169 days (MAD). Eight men and 24 women were included in the MAD cohort.

Results: Dose- and exposure-dependent increases in lumbar spine (LS), total hip (TH) and femoral neck (FN) BMD were observed in both the SAD and MAD cohorts in both male and female participants. A 10.7% LS BMD increase and 4.9% TH BMD increase were observed in the 12 mg/kg MAD cohort on Day 169. LS BMD increased by 10.7% in female participants (n=4) compared to 10.6% in male participants (n=2). TH BMD increased by 5.4% in female participants compared to 3.7% in male participants. Previously reported results included a per-protocol analysis, excluding one male participant who received two doses of AGA2118. The data presented here includes all participants who received at least one dose of AGA2118. AGA2118 was safe and well-tolerated at all dose levels tested. The incidence of treatment-emergent adverse events (AEs) and drug-related AEs in the AGA2118 cohorts versus placebo were balanced. No treatment-related serious AEs were reported.

Conclusion: Single and multiple doses of AGA2118 were well-tolerated and showed robust bone building efficacy in both male and female healthy volunteers. These data support further clinical development of AGA2118 for the treatment of osteoporosis.



OC2

WEEKLY VITAMIN D AND DAILY CALCIUM CARBONATE OVER 48-WEEKS INCREASES BONE DENSITY IN ADOLESCENTS WITH HIV AND 25(OH) D <75NMOL/L: A PLACEBO-CONTROLLED TRIAL IN SOUTHERN AFRICA

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Objective

HIV adversely affects skeletal development despite antiretroviral therapy (ART), and vitamin D insufficiency is common. Dietary calcium intakes are low in Southern Africa. Our trial determined whether vitamin D and calcium supplementation improves bone density in adolescents with HIV, particularly those with vitamin D insufficiency.

Methods

A multi-country individually randomised, double-blinded placebo-controlled trial of weekly vitamin D (20,000IU) plus daily calcium carbonate (500mg) for 48 weeks, recruited adolescents with HIV age 11-19 years, taking ART for ≥6 months from HIV clinics in Zimbabwe and Zambia. The primary outcome was DXA-measured total body less-head bone mineral density (TBLH-BMD) Z-score using a UK reference population. The secondary outcome was lumbar spine bone mineral apparent density (LS-BMAD) Z-score. Linear regression compared arms adjusting for site and baseline Z-Score. Sub-group analyses by baseline vitamin D insufficiency (defined in this region as 25(OH)D <75nmol/l) were pre-specified.

Results

842 adolescents [53.2% female] were enrolled; most (75.9%) had 25(OH)D <75nmol/l. At 48 weeks 751 (89.2%) were available for

a DXA. Overall, there was no difference by arm in mean 48-week TBLH-BMD Z-score [-1.56 (SD 1.12) in intervention vs -1.53 (1.18) in control arm, adjusted mean difference (AMD) -0.03 (95%CI -0.08, 0.02)]. Findings were similar for LS-BMAD Z-score. However, in those with baseline 25(OH)D <75nmol/l both TBLH-BMD and LS-BMAD Z-scores were higher at 48 weeks in those randomized to supplementation (Table-1). There was no evidence of interaction by age, sex or puberty. No drug-related severe adverse events occurred.

Conclusions

Higher-dose vitamin D and lower-dose calcium, are safe and cheap interventions during adolescence, and may promote bone accrual towards maximizing peak bone mass to reduce future fracture risk in African adolescents growing up with HIV.

Baseline 25(OH)D concentration	N	Supplemented Mean (SD)	Placebo Mean (SD)	AMD (95%CI)	P-value	Interaction P-value
TBLH-BMD Z-score						
<75nmol/L	562	-1.53 (1.22)	-1.61 (1.13)	0.04 (0.00, 0.08)	0.027	0.078
≥75nmol/l	189	-1.52 (1.03)	-1.45 (1.12)	-0.05 (-0.16, 0.07)	0.44	
LS-BMAD Z-score						
<75nmol/L	558	-0.64 (1.19)	-0.71 (1.13)	0.04 (0.02, 0.11)	0.016	0.013
≥75nmol/l	188	-0.51 (1.08)	-0.70 (1.24)	-0.10 (-0.23, 0.03)	0.13	

OC3

PTH1 RECEPTOR AGONISTS FOR FRACTURE RISK: A SYSTEMATIC REVIEW AND NETWORK META-ANALYSIS

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Introduction: Osteoporosis, defined by reduced bone mineral density and macro- and micro-architectural degradation, leads to increased fracture risk, particularly in aging populations. While randomized controlled trials (RCTs) demonstrate that PTH1 receptor agonists, teriparatide and abaloparatide, are effective at reducing fracture risk, real-world evidence (RWE) remains sparse. This study reviews and compares the anti-fracture efficacy of these agents, against each other and against other osteoporosis treatments using both RCTs and RWE.

Methods: We systematically searched Medline, Embase, and Cochrane up to May 2024, focusing on RCTs and RWE studies reporting reduction in vertebral, non-vertebral, hip, or all fractures as primary endpoint. A network meta-analysis (NMA) was conducted, first through pairwise meta-analyses of teriparatide versus abaloparatide, then a Bayesian NMA comparing each to other treatments. Safety assessments included adverse events (AEs) classified by MedDRA, with a particular attention to hypercalcemia and cardiac events.

Results: Seventeen studies (11 RCTs, 6 RWE) met inclusion criteria. Teriparatide and abaloparatide were effective in reducing vertebral and non-vertebral fractures in all pairwise meta-analyses vs. placebo. Abaloparatide showed an advantage over teriparatide for non-vertebral fractures (OR: 0.87, 95% CI: 0.80-0.95) and hip fractures (OR: 0.81, 95%CI: 0.71-0.93).

In the NMA model, teriparatide and abaloparatide were superior to placebo, raloxifene and calcitonin in reducing vertebral fracture while teriparatide was further superior to denosumab and risedronate. For non-vertebral fracture, abaloparatide was better than any other treatment while teriparatide was only superior to alendronate or placebo. PTH1 analogs were better than placebo at reducing all fractures while no difference was observed for the risk of hip fracture.

Both abaloparatide and teriparatide demonstrate comparable safety to other osteoporosis treatments, with no increased cardiovascular risk.

Conclusion: This review highlights that PTH1 receptor agonists effectively reduce fracture risk, with abaloparatide offering enhanced benefits for non-vertebral and hip fractures compared to teriparatide. Both agents exhibit acceptable safety profiles, suggesting their valuable role in managing osteoporosis, particularly for high-risk patients.

OC4

EFFECTS OF EB613 TABLETS [ORAL PTH(1-34)] ON TRABECULAR AND CORTICAL BONE USING 3D-DXA: POST-HOC RESULTS FROM PHASE 2 STUDY

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Objectives: EB613 is being developed as the first once-daily oral PTH(1-34) tablet treatment for postmenopausal women with osteoporosis at increased risk for fracture. In Phase 2 (NCT04003467),

EB613 2.5 mg increased bone mineral density (BMD) associated with increased bone formation (PINP) & decreased bone resorption (CTX). We characterized early effects on trabecular & cortical bone of the proximal femur using 3D-DXA modeling.

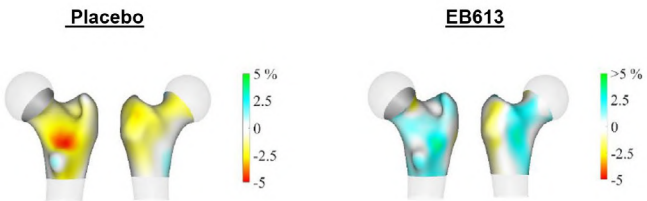
Materials and Methods: In this post-hoc study, all Phase 2 study subjects from the EB613 2.5 mg (n=21) and placebo groups (n=38) who had DXA hip scans at baseline & 6 months were included. Scans were analyzed using 3D-Shaper® software to assess trabecular and cortical compartments, and 3D-DXA models were developed to show anatomical distribution of structural changes. For each parameter, % change from baseline for each subject and mean (SD) for both groups were calculated. Data were analyzed within groups vs baseline and between groups using t-tests.

Results: At 6 months, in subjects on EB613 vs placebo, areal BMD of the total hip (TH) and femoral neck (FN) increased 1.8% and 2.6%, respectively (both p<0.01). Integral volumetric BMD (vBMD) of the TH and FN increased with EB613 vs placebo by 1.7% (p<0.08) and 2.6% (p<0.03), respectively. TH trabecular vBMD increased 2.8% with EB613 (p=0.05 vs baseline; group difference NS) and FN trabecular vBMD increased 4.4% vs placebo (group difference p<0.03). While cortical vBMD changes with EB613 vs placebo were small and NS, cortical surface BMD increments with EB613 vs placebo were 1.5% and 2.1% in the TH and FN, respectively (both p<0.05; Figure). Cortical thickness increments with EB613 vs placebo were 1.3% in the TH (p=0.04) and 1.7% in the FN (p=0.056).

Conclusions: 6-months treatment with EB613 showed evidence of an early effect on both trabecular and cortical bone of the proximal femur, consistent with the dual mechanism of increased formation and decreased resorption. Safety and efficacy of EB613 will be evaluated in the planned Phase 3 trial.

Disclosures: GB, CI, HG, MK, and **MT** are employees of and may own stock/options in Entera Bio Ltd. **LH** is a stockholder and employee of 3D-Shaper Medical. **RB, SLF,** and **FC** are consultants for Entera. **RBW** is an advisor to Entera.

Figure 1. 3D visualisation of the periosteal surface of the femur indicating the anatomical improvement in cortical surface BMD with EB613 vs placebo at 6 months.



OC5

SUSTAINED REDUCTION IN FRACTURE RATE IN PATIENTS WITH OI TREATED WITH SETRUSUMAB: FOURTEEN MONTH DATA FROM PHASE 2 OF THE PHASE 2/3 ORBIT STUDY

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Osteogenesis imperfecta (OI) is a rare genetic disorder of bone fragility and low bone mass with no universally-accepted treatment. Setrusumab is a fully human anti-sclerostin monoclonal antibody that improves bone mineral density (BMD), strength, and remodeling in adults with OI. Phase 2 of the Phase 2/3 Orbit study (NCT05125809) assessed its efficacy and safety in children and young-adults. Subjects with OI Types I, III, or IV, ages 5 to <26 years, were randomized 1:1 to receive 20 or 40 mg/kg setrusumab intravenously monthly. Once the last subject completed 6 months of treatment, all subjects switched to 20 mg/kg. Dose groups were pooled for analysis.

Twenty-four subjects (50% female, 75% <18 years old) with OI Type I (n=17/24, 71%) or III/IV (n=7/24, 29%) were assessed (mean, median treatment duration: 16, 15 months).

Subjects continued meaningful BMD improvement. A mean (SE) change from baseline (BL) in lumbar spine BMD of 14.19% (2.15%) was seen at Month (M) 6, and 22.25% (2.71%) at M12 (p<0.0001). Mean (SE) BL BMD Z-score improved by 0.85 (0.13) at M6, and 1.25 (0.17) at M12 (p<0.0001).

The median annualized pre-treatment fracture rate (excluding fingers, toes, face, skull, and morphometric vertebral fractures) fell from 0.72 to 0 (p=0.0014) after a mean 16 months of treatment, (67% calculated reduction). No safety concerns were identified at M14. Treatment-emergent adverse events (TEAE) supported the anticipated safety profile of setrusumab. Most related TEAEs (11/12, 92%) were mild (Grade 1), with no related serious TEAEs or cardiovascular TEAEs reported. No TEAEs led to study/treatment discontinuation or disruption.

We observed significant, clinically meaningful improvements from BL in lumbar spine BMD and BMD Z-score at M14. A clinically meaningful reduction in skeletal fracture rate was achieved with setrusumab (67%). Findings build upon those after 6 months, demonstrating the robustness and durability of setrusumab in OI.

OC6

PROGRESSIVE DECREASES IN FRACTURE INCIDENCE WITH ZOLEDRONATE USE >3 YEARS

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[1]University of Auckland, Auckland, New Zealand

Background

The anti-fracture efficacy of most osteoporosis drugs is assessed in trials of up to three years duration. However, treatment of osteoporosis is required long-term, so it is important to know whether effectiveness of treatment changes over time. To-date, this information has only been available from open extensions of the treatment groups from clinical trials. Such data are subject to selective loss of frailer patients from the cohort, and no placebo comparator group is available to permit reliable measurement of anti-fracture efficacy.

Methods

Our 6-year RCT of zoledronate or placebo every 18 months in 2000 osteopenic women aged >65 years is longer than most other trials of osteoporosis drugs, and only 3.6% of participants withdrew or were lost to follow-up (Reid IR et al, NEJM 379:2407, 2018). Therefore, anti-fracture efficacy can be validly compared between the first and second halves of this study.

Results

There were 178 non-vertebral fractures in the placebo group and 108 in the zoledronate group (excluding fractures of the hands, feet and face). Fracture rates per 1000 women-years in the placebo group were 28 (95%CI 23,35) and 32 (26, 40) in years 1-3 and years 4-6, respectively. In the zoledronate group, fracture rates were 23 (18, 30) and 13 (9, 18) per 1000 women-years in the first and second halves of the study. The rate ratios for non-vertebral fractures were 0.83 (0.60, 1.14) in years 1-3, and 0.40 (0.27, 0.58) in years 4-6 (between-period comparison, $P<0.05$). Rates ratios for total fragility fractures, which included vertebral fractures also, showed a similar pattern: years 1-3, 0.72 (0.54, 0.97); years 4-6, 0.37 (0.28, 0.50).

Conclusion

These findings suggest that the efficacy in non-vertebral fracture prevention of anti-resorptive drugs has been underestimated because of the short-term evaluation of their effects. Further, it indicates that longer term treatment with these drugs may yield greater benefit to patients.

OC7

COMPREHENSIVE COMPARATIVE ANALYSIS OF INFRAPATELLAR FAT PAD MORPHOLOGIES IN A LONGITUDINAL KNEE OSTEOARTHRITIS STUDY: NEW INSIGHTS INTO ITS ROLE AS A PROGNOSTIC MARKER

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Objective: No established markers effectively phenotype knee osteoarthritis (OA) patients into subgroups. Data on infrapatellar fat pad (IPFP) morphology predicting disease symptoms, structural changes, and knee replacement (KR) are sparse and conflicting. This 96-month longitudinal study aimed to identify the most effective prognostic markers by comparing various IPFP morphological features against these outcomes.

Methods: This study analyzed 1075 knees from the Osteoarthritis Initiative (OAI) progression cohort. Structural changes included cartilage, bone marrow lesions (BML), and joint effusion volumes assessed using quantitative and automated MRI systems. IPFP global and signal (hyper- and hypo-) intensity volumes and areas were measured using MRI combined with a newly fully automated neuron-driven technology[1]. Symptoms were evaluated using WOMAC. KR data were obtained from the OAI database. Data was collected at baseline, 12, 24, 48 and 96 months and analyzed using a mixed model for repeated measures and ANCOVA.

Results: Baseline characteristics were mild to moderate knee OA. Over time, WOMAC scores, cartilage volume, and IPFP global and hypointense signal volumes and maximal and hypointense signal areas decreased (all ≤ 0.001). Joint effusion and hyperintense signal volume and area increased (both ≤ 0.001). Associations were found between baseline IPFP morphologies and changes in cartilage volume (hypo- and hyperintense volumes, 48, 96 months, $p \leq 0.04$), BML volume (global volume 48 months, $p=0.05$; hyperintense area, 12 months, $p \leq 0.04$), and effusion volume (hypointense volume 48 months and hyperintense volume 96 months, $p \leq 0.05$). At baseline, smaller IPFP sizes (below median) were associated with cumulative KR at 96 months (global and hypointense volumes, $p \leq 0.04$ and maximal area, $p=0.05$).

Conclusions: This longitudinal study, leveraging an innovative IPFP assessment technology, highlights that IPFP volume (global and both signals) surpasses area metrics in predicting long-term OA structural changes, and smaller IPFP volumes and areas are linked with reduced KR need. These findings provide new insights into the usefulness of IPFP morphology as a predictive biomarker of knee OA outcomes, offering a new approach to stratifying knee OA patients.

[1]Bonakdari H et al. *Sci Rep* 2020; 10:9993.

OC8

RESULTS FROM A RANDOMISED CONTROLLED PHASE II TRIAL WITH LEVI-04, A NOVEL NEUROTROPHIN-3 INHIBITOR, DEMONSTRATE SUBSTANTIALLY IMPROVED PAIN AND FUNCTION WITHOUT DELETERIOUS EFFECTS ON JOINT STRUCTURE IN PEOPLE WITH KNEE OSTEOARTHRITIS

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Objective

To assess efficacy and safety of LEVI-04 in people with knee OA.

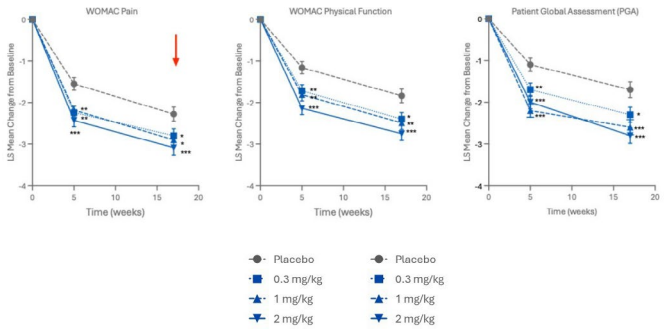
Materials and Methods

This was a 20-week PhII multicentre RCT in people with painful (≥4/10 WOMAC), radiographic (KL≥2) knee OA. Participants were randomised to baseline then 4-weekly IV placebo or 0.3, 1 or 2 mg/kg LEVI-04 through wk16, with safety follow-up to wk30. The primary endpoint was change in WOMAC pain to wk17, with secondary outcomes including function and PGA.

Results

518 people were enrolled, balanced across groups (mean age 63.1–65.4 years, mean BMI 29.3–30.3, proportion female 51.5–61.5%). Statistical significance was met for the primary and secondary efficacy endpoints (Figure 1) at wk5 and wk17 ($p<0.05$ vs placebo). LEVI-04 was well tolerated, with no increase in SAEs, TEAEs and joint pathologies, including rapidly progressive OA (RPOA), vs. placebo. SAEs reported were 0, 1 (0.8%), 3 (2.3%), and 3 (2.3%) in the 0.3mg/kg, 1mg/kg, 2mg/kg, and placebo groups, respectively. TEAEs occurred in 58.1%, 66.2%, 64.3% and 67.4% of participants in 0.3mg/kg, 1mg/kg, 2mg/kg, and placebo groups, respectively. There were 4 cases of RPOA Type 1: 2 in the 1mg/kg, 1 in the 2mg/kg and 1 in the placebo group. 2 subchondral insufficiency fractures were reported: 1 in a shoulder with pre-existing OA in the 1mg/kg group, and 1 in the knee in the placebo group. There were no reports of osteonecrosis or RPOA Type 2. 3 participants had a knee joint replacement; 1 in each of the active arms, all were KL grade 4 at study entry.

Figure 1. Efficacy Endpoints (arrow indicates primary endpoint)



Conclusion

LEVI-04 demonstrated significant and clinically meaningful improvement in pain, function, and other outcomes. LEVI-04 was well tolerated at all doses, supporting the concept of supplementing endogenous p75NTR as a treatment for OA and other pain conditions. Phase III trials are in planning.

OC9

A PHASE 1B RANDOMIZED CONTROLLED TRIAL EVALUATING SAFETY AND PHARMACODYNAMICS OF A NOVEL IL-1RA GENE THERAPY (GNSC-001) INJECTION IN KNEE OA: 6-MONTH INTERIM RESULTS

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Objectives Evaluate safety of GNSC-001 dose regimens with / without corticosteroid (CS) immune-conditioning versus placebo (PBO) in knee OA participants (Pts) for 1 year and measure transgenic IL-1Ra levels in synovial fluid (SF). Six-month interim results are reported. **Materials and Methods** Knee OA Pts age 40-75 years, KL 2-3, WOMAC target knee pain ≥20/50 were randomized to 5 Groups (Gps): 1) GNSC-001 $1x10^{12}$ vector genomes (vg); 2) GNSC-001 $1×10^{12}$ vg + oral CS; 3) GNSC-001 $1×10^{13}$ vg; 4) GNSC-001 $1×10^{13}$ vg + oral CS; 5) PBO no CS. Gps 1 and 3 received 7 days oral CS (on Day -1 with 6-week taper). Open-label Grp 6 required knee SF aspiration prior to dosing and received 3 days oral CS (from Day -1) with IA CS (on Day 1). All Pts received IA GNSC-001 or PBO on Day 1 (Baseline [BL]), and had visits at Months 1, 3, and 6. **Results** BL characteristics [mean (±SD) or (%)] of 67 6-month completers were: female sex n= 52 (78%); age 60.9 (8.5) years; BMI 28.6 (4.3) kg/m^2; WOMAC Pain [0-100] = 61.9 (15.6) and Function = 62.4 (15.6); KL Grades 2, n= 35 (52.2%) and 3, n= 31 (46.3%). No deaths or safety-related withdrawals occurred. Two treatment-unrelated SAEs occurred. TEAEs across Gps [(n)(Pts>1 TEAE)] were: 1) 15(6); 2) 23(7); 3) 13(6); 4) 21(6); 5) 16(5); 6) 52(9). Target knee AEs (TKAEs) across Gps [(n)(Pts>1 TKAE)] were 1) 3(2); 2) 4(3); 3) 4(2); 4) 9(4); 5) 4(3); 6) 23(8). TKAEs >1 included arthralgia (n=12); swelling (n= 6); effusion (n=3) and stiffness (n=3). All TEAEs and TKAEs were Grade 1-2, apart from one Grade 3 AE (recurrent effusion) in Grp 6. Mean BL SF IL-1Ra level [pg/mL(±SD)] was 158.3 (327.3) pg/mL. Mean Month 6 lev-

els were (pg/mL±SD, n = Pts with >1 SF sample including Month 6): 1) 1006.7 (941.1) (n=4); 2) 2135.9 (2326.0) (n=7); 3) 245.5 (148.8) (n=5); 4) 3999.5 (4816.1) (n=7); 5) 128.7 (45.3) (n=6); 6) 2703.5 (2254.8) (n=11). **Conclusion** GNSC-001 was well tolerated with no treatment-related SAEs, and mostly mild / moderate TEAEs. Grp 6 trended higher in number of TKAEs; it was unclear if this was due to patient population differences, with SF aspiration required at entry, due to chance or CS regimen. All GNSC-001 groups showed persistently elevated IL-1Ra expression in SF, and immune-conditioning was associated with higher levels. Based on 6-month data, GNSC-001 shows promise for the treatment of knee OA.

OC10

EFFECTIVENESS OF CELECOXIB IN REDUCING OSTEOARTHRITIS (OA) PAIN IN PATIENTS WITH MODERATE AND SEVERE PAIN: ONCE-DAILY VS TWICE-DAILY DOSING

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Objective

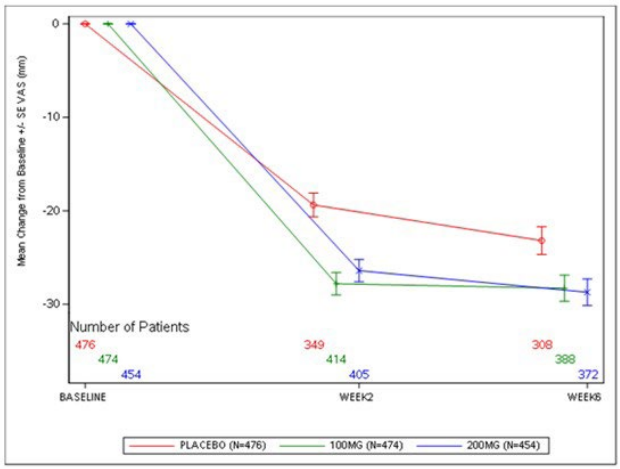
To assess the effectiveness of Celecoxib(100 mg BID or 200 mg OD) using Visual Analog Scale(VAS) score in reducing moderate(VAS≥40&≤69) to severe(VAS≥70) knee OA pain.

Material and Methods

A pooled analysis combined two previously published near identical 6 week studies of patients with OA of the knee. Participants received either placebo, 100 mg Celecoxib, or 200 mg Celecoxib. The primary endpoint was change in pain VAS scores upto week 6 from baseline. Pain scores were measured at baseline, week 2, and week 6.

Results

A total of 1404 participants either received placebo(n=476), Celecoxib as 100 mg(n=474), or Celecoxib as 200 mg(n=454). At baseline, 675 had moderate pain, 685 had severe pain, 44 patients had mild pain(VAS<40). The results confirming the efficacy of two doses of Celecoxib at week 6 are presented in figure1.



The 100-mm visual analog scale ranges from 0 (no pain) to 100 (very severe pain). Change from Baseline of VAS has been plotted over Time.

Figure 1. Change from baseline of patient's assessment of OA Pain-VAS at week 2&6

In patients with moderate pain, both 100 mg & 200 mg Celecoxib significantly reduced pain compared with placebo at week 2&6(LSM diff. -8.18 (p=0.0009) & -5.37(p=0.0318), respectively). In patients with severe pain, both 100 mg and 200 mg Celecoxib significantly reduced pain compared with placebo at week 2 (LSM diff. -8.96(p=0.0007) and -8.43(p=0.0015), resp. At week 6, Celecoxib 100 mg demonstrated no statistically significant difference with placebo, while Celecoxib 200 mg statistically significantly reduced pain (LSM diff. of -3.37(p=0.2592) and -7.45(p=0.0135), respectively).

Conclusions

Celecoxib (both dosing regimens) effectively reduced pain in patients with moderate and severe knee OA. Data from the 6 week interval may suggest that 200 mg OD per day might be the preferred regimen for severe pain management.

OC11

10-YEAR FOLLOW-UP AFTER INTRA-ARTICULAR INJECTIONS OF 2.5 % POLYACRYLAMIDE HYDROGEL FOR KNEE OSTEOARTHRITIS

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Objective:
To evaluate long term safety of intra-articular 2.5 % polyacrylamide hydrogel (iPAAG)

Material and Methods
Patients treated off-label with iPAAG for radiologically verified knee OA in the period 2010 until 2017 were recalled. Medical and surgical records were obtained on all recalled patients and scrutinized for possible adverse events or abnormal reactions related to the injection, and in the event of subsequent surgery, for peri- and post-operative complications for the treated knee(s). An interview was also conducted for retrospective self-reported adverse events after the injection of iPAAG. The time between IA injection and knee surgery was recorded.

Results:
A total of 61 patients (24 women and 37 men) participated. At the time of injection, mean age was 64 years (range 34-81) and mean BMI was 27 kg/m^2 (range 19-43 kg/m^2). Some patients had treatment of both knees and 89 knees were included. Observation time from the iPAAG treatment to follow-up was mean 9.92 years (range 7-14 years).
No significant AEs related to iPAAG were reported by patients or found in the records; thus, no allergic reactions, infections or systemic adverse events were noted.
In 39 cases (39/89, 43.8 %) a knee replacement was performed after a mean time lapse of 3.4 years (range 0.2-7.6 years). The mean time lapse was similar for all KL grades. Post surgical abnormal events were noted in 2 cases: 1 had prolonged knee bleeding and the other had an infection that required revision and prolonged antibiotics. These 2 patients had received multiple other injections including glucocorticosteroids, both before and after the iPAAG.

Conclusion:
Long-term results after iPAAG indicated a favourable safety profile of the product, with very few patients recalling pain or problems post-injection. Surgical records from subsequent knee replacements gave no indications of unusual adverse reactions.

Disclosure:
This work was supported by an institutional grant from Contura International A/S to the Parker Institute and the company had no influence on the design and execution of the study. None of the authors are employed by or have shares in this company.

OC12

EFFECTS OF INTRA-ARTICULAR HYALURONIC ACID INJECTIONS ON PAIN AND FUNCTION IN KNEE OSTEOARTHRITIS PATIENTS: AN UMBRELLA REVIEW OF SYSTEMATIC REVIEWS AND META-ANALYSES OF RANDOMIZED PLACEBO-CONTROLLED TRIALS

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Introduction: Knee osteoarthritis (OA) is a prevalent and disabling condition characterized by pain and functional impairment. Intra-articular hyaluronic acid (IAHA) injections are widely used for symptom relief, but their efficacy remains debated due to conflicting conclusions across systematic reviews (SRs) and meta-analyses (MAs). This umbrella review aims to assess the symptomatic efficacy of IAHA in knee OA based on evidence reported by previously conducted SR and MA, identify factors contributing to discrepancies in SR/MA findings, and summarize consistent outcome trends.
Methods: This umbrella review followed Cochrane guidelines for overviews of reviews and adhered to the PRIOR reporting checklist. It was registered in PROSPERO (CRD42024625696). A systematic search was conducted in Medline (Ovid), Cochrane Database of Systematic Reviews (Ovid CDSR), and Embase, using a predefined Population/Intervention/Comparator/Outcome/Study design (PICOS) framework. SRs of randomized controlled trials (RCTs) evaluating IAHA efficacy on pain and/or function compared to placebo were included. Exclusion criteria were SRs including both RCTs and non-RCTs without separate synthesis of data from RCTs, scoping reviews, abstracts, commentaries, or narrative reviews. Two independent reviewers screened titles,/abstracts, and full texts, resolving disagreements by consensus. Risk of bias was assessed using the AMSTAR-2 checklist, classifying SRs as high, moderate, low, or critically low quality.
Results: Twenty-two SRs were included, with AMSTAR-2 quality ratings as follows: four high, one moderate, three low, and fourteen critically low. The majority (20/22) reported significant beneficial effects of IAHA on pain and function, with 15 SRs concluding positive outcomes, 3 reporting mixed conclusions, and 4 reporting negative conclusions. Among high/moderate-quality SRs, all five reported significant beneficial effects, with three concluding positively and two negatively. Negative or mixed conclusions were primarily attributed to restrictive inclusion criteria (e.g., large trial-only analyses, minimum patient numbers, long follow-up periods) and challenges in interpreting clinical relevance.
Conclusion: Most SRs and all high-quality SRs support the significant symptomatic efficacy of IAHA in knee OA. Negative interpretations arise when restrictive inclusion criteria challenge the clinical relevance of results. These findings highlight the need for standardized methodologies in SRs to provide clearer guidance for clinical practice.

OC13

ASSESSING BONE MINERAL DENSITY: A COMPARATIVE STUDY OF DXA AND RADIOFREQUENCY ECHOGRAPHIC MULTI-SPECTROMETRY (REMS) IN ASIAN POPULATION

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Objective: The Radiofrequency Echographic Multi-Spectrometry (REMS) method is a novel ultrasound diagnostic technique for measuring bone mineral density (BMD) in the lumbar spine (LS) and femoral neck (FN), with reports of a high correlation with dual-energy X-ray absorptiometry (DXA). However, clinical data in Asian population are still insufficient. This study aimed to compare BMD between the DXA and the REMS.

Methods: The study included 88 patients (M/F: 40/48) who underwent BMD assessment using both DXA and REMS at Fujita Health University Hospital in 2023. BMD measurements at the LS and FN were performed using DXA (Horizon W, Hologic, Inc., USA) and a REMS device (EchoS, Echolight S.p.A., Lecce, Italy). The mean age of the study subjects was 65.9 ± 14.8 years, and the BMI was 24.0 ± 4.2 kg/m². Comorbidities included type 2 diabetes mellitus in 76 patients, long-term glucocorticoid use (≥3 months) in 7 patients. Nineteen patients were receiving treatment for osteoporosis. Vertebral fractures and hip fractures were reported in 22 and 9 cases, respectively.

Results: At the LS, the mean T-score obtained by DXA was -1.00 ± 1.54, while REMS showed a significantly lower value of -2.48 ± 0.94 ($p<0.0001$). At the FN, DXA yielded -1.74 ± 1.16, whereas REMS showed -2.40 ± 1.05 ($p<0.0001$). Significant correlation was observed between DXA and REMS T-scores (LS: $R=0.294$, $p=0.0063$; FN: $R=0.541$, $p<0.0001$). Osteoporosis diagnosis rates differed: DXA classified 34 patients as having osteoporosis and 37 as osteopenia, whereas REMS identified 55 with osteoporosis and 28 with osteopenia. Among vertebral fractures patients, REMS classified all cases as osteopenia or osteoporosis, whereas DXA identified half as having normal BMD.

Conclusion: REMS provides a safe, radiation-free alternative for BMD assessment and has the potential to provide new insights into bone assessment independent of DXA.

The authors declare no conflicts of interest associated with this manuscript.

OC14

RAPID BONE MICROARCHITECTURE DECLINE, BUT NOT HIGHER FRACTURE RISK, IN MEN WITH ELEVATED FGF23 CONCENTRATION – THE STRAMBO STUDY

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Objective: Data on the association of fibroblast growth factor 23 (FGF23) with bone structure and fracture risk are limited. We studied the link of baseline FGF23 levels with the prospectively assessed bone microarchitecture decline and fracture risk over 12 years in older men.

Material and Methods: Serum FGF23 was measured at baseline in a cohort of 829 men aged 60-87 (Immunotopics, San Clemente, CA). Bone microarchitecture was assessed at the distal radius and distal tibia by HR-pQCT (XtremeCT I, SCANCO, Switzerland) at baseline and after 4, 8, and 12 yrs. Incident spine fractures were assessed on DXA scans. Self-reported incident non-spine fractures were confirmed by a health professional.

Results: At the distal radius, the rate of loss of total bone mineral density (Tt.BMD) increased with higher FGF23 levels (adjusted for confounders $p<0.001$). The rate of decrease in cortical thickness (Ct.Th) and density (Ct.BMD), and of trabecular area (Tb.Ar) expansion increased across the FGF23 quartiles ($p<0.01$ to <0.001). Failure load decreased faster ($p<0.01$) in the highest *vs.* the lowest FGF23 quartile (>32.3 *vs.* <17.4 RU/mL). Rates of change in trabecular density (Tb.BMD), number (Tb.N), thickness (Tb.Th), separation (Tb.Sp) or homogeneity of distribution (Tb.1/N.SD) did not correlate with the FGF23 level.

At the distal tibia, the rate of decrease in Tt.BMD, Ct.Th, Ct.BMD and failure load and the rate of Tb.Ar expansion increased across the FGF23 quartiles (all $p<0.001$ in multivariable models). Rates of change in the trabecular measures did not vary across the FGF23 quartiles.

After adjustment for age, BMI, BMD, falls and fractures, FGF23 level did not predict fractures (all fractures: n=157, HR= 0.95 per SD, 95%CI: 0.79–1.14; major osteoporotic fractures: n=60, HR= 1.02 per SD, 95%CI: 0.76–1.36).

Conclusion: In a cohort of older men followed prospectively for 12 years, higher FGF23 level was associated with faster cortical bone deterioration, but not with the risk of fracture.

OC15

NUMBER OF FRACTURES AND FRACTURE INCIDENCE IN RELATION TO BONE MINERAL DENSITY: AN INTERNATIONAL META-ANALYSIS

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Objectives Femoral neck bone mineral density (BMD) is an important determinant of fracture risk and an optional input into FRAX®. As one of a number of studies informing the next iteration of FRAX, the aim of this preliminary international analysis was to prospectively investigate, in men and women, the incidence and absolute number of fractures by baseline BMD T-score.

Materials and methods The analysis dataset comprised individual records of 160,035 men and women with information on BMD, from 51 cohorts in 25 countries. The total follow-up time was 1.3 million person-years. The risk of major osteoporotic fracture (MOF) or hip fracture (HF) was studied. The number of fractures and total person-years follow up time was summed by intervals of 0.5 SD in BMD T-score over all cohorts. The fracture incidence was calculated from number of fractures over total follow up of time in the interval.

Results Among the 48,811 men and 111,224 women, aged 68.3 (range 50-101), 17,968 individuals experienced one or more MOF and 5883 experienced one or more HF (1406 in men and 4477 in women). A minority of individuals had a BMD T-score <-2.5 (3.3% men and 16.1% women). For men 85.8% of the hip fractures occurred for those with BMD T-score equal or above -2.5; the corresponding figure for women was 60.7%. In the interval from -2.5 to -1, 59.4% of the hip fractures occurred for men and 52.7% of the women. Nevertheless, the highest fracture incidences are found for the lowest BMD T-scores (see figure for hip fractures in women). Similar findings were demonstrated for MOF and for men.

Conclusions These data confirm the importance of femoral neck BMD as a determinant of fracture risk but relatively low sensitivity (many fractures occur in individuals without osteoporosis). These data will inform the next iteration of FRAX.

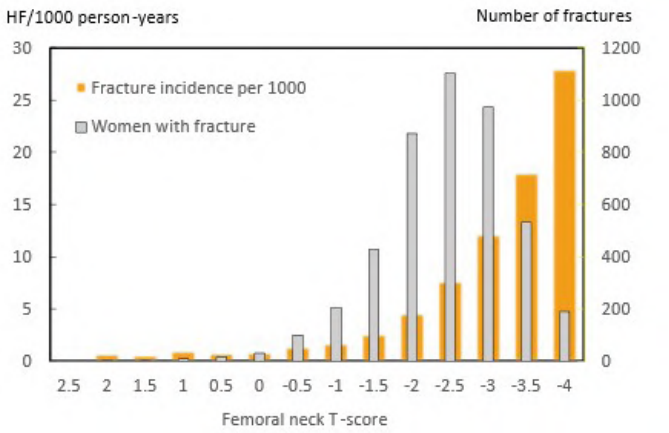

Figure. Number of women with at least one hip fracture (grey bars, right y axis)) and hip fracture incidence (orange bars, left y axis) in relation to BMD T-score in women (x axis) where "-2.5" represents -2.5≤x<-2.0, "-2" represents -2.0≤x<-1.5, etc.

OC16

TYPE I DIABETES MELLITUS IS ASSOCIATED WITH INCREASED FRACTURE RISK INDEPENDENT OF BONE MINERAL DENSITY: AN INTERNATIONAL META-ANALYSIS

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Objectives
In this international meta-analysis, we investigated the predictive value of type I diabetes mellitus for incident fracture in men and women, and whether this risk was independent of femoral neck bone mineral density (BMD).

Materials and methods
The interim analysis dataset comprised individual records of 78,130 participants (78.2% women) with information on diabetes status and BMD, from 14 cohorts across 19 countries. The total follow-up time was 0.7 million person-years. We investigated associations between the presence/absence of type I diabetes mellitus at baseline and risk of osteoporotic fracture or hip fracture using an extended Poisson model in each cohort. The covariates examined were age, sex, duration of follow-up and femoral neck BMD T-score. The results of the different studies were merged by using the inverse-variance weighted β-coefficients in random effects models.

Results
After adjustment for age and time since baseline, type 1 diabetes was associated with a greater risk of incident osteoporotic fracture in both men [hazard ratio (95% CI): 2.90 (1.30, 6.48)] and women [1.65 (1.23, 2.21)]. Similar associations were demonstrated for hip fracture in men, albeit with lower statistical certainty [4.22 (0.90, 19.71)], and in women [1.60 (1.02, 2.52)]. Although the effect was not statistically significant, adjustment for BMD T-score tended to slightly decrease the point estimate in men and increase it in women. For example, for incident osteoporotic fracture: men 2.28 (1.20, 4.35); women 1.74 (1.29, 2.34).
Conclusions
In one of the largest ever meta-analyses undertaken to date, type 1 diabetes was associated with increased fracture risk. The risk appeared largely independent of femoral neck BMD. These findings will inform the next iteration of the FRAX® calculator.

OC17

EXTERNAL VALIDATION OF AN AI-DRIVEN RADIOGRAPHIC TOOL FOR OPPORTUNISTIC DETECTION OF HIGH BONE FRAGILITY RISK IN DIVERSE INTERNATIONAL COHORTS

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Objective: Over 37 million fragility fractures occur annually, yet early identification of high-risk individuals remains a major challenge. This study externally validates an AI-powered radiographic analysis tool designed for opportunistic detection of *very high bone fragility* risk in a European Caucasian cohort and an ethnically-diverse U.S.- cohort.
Methods: The multi-stage AI-driven bone fragility detection tool first applies an automatic detection and segmentation of lumbar vertebrae before fragility risk assessment. The very high bone fragility risk classifier was trained and validated using 16'622 paired lumbar-spine X-ray DICOM and DXA scans, with a further internal test set of 1`846 individuals. Two external cohorts were used for validation: a European cohort (N=220) and a U.S.-based cohort (N=647). Very high bone fragility risk was defined using DXA-derived criteria: Lumbar spine BMD T-score ≤ -2.5 and degraded trabecular bone score (TBS) < 1.23.
Results: In the internal test set, participants had a mean age of 62.2 ± 10.4 years, a BMI of 25.3 ± 4.2 kg/m², and a 15% prevalence of very high fragility risk. The AI model demonstrated an accuracy of 0.86 (95% CI: 0.82–0.90), a sensitivity of 0.76 (0.66–0.86), and a specificity of 0.87 (0.82–0.99). In the external validation, the European cohort, composed of White individuals, had a mean age of 68.3 ± 11.3 years, a BMI of 26.8 ± 12.9 kg/m², and a 22% prevalence of very high fragility risk. The AI tool achieved an accuracy of 0.83 (95% CI: 0.71–0.93), a sensitivity of 0.56 (0.32–0.70), a specificity of 0.92 (0.79–0.99), and an AUC of 0.86 (0.82–0.91) in this cohort. The U.S. cohort, which included 32% Black, 55% Hispanic, 6% Asian, and 7% White individuals, had a mean age of 67.3 ± 9.8 years, a BMI of 28.5 ± 5.7 kg/m², and a 11% prevalence of very high fragility risk. In this cohort, the AI tool achieved an accuracy of 0.87 (95% CI: 0.81–0.95), a sensitivity of 0.50 (0.23–0.55), a specificity of 0.92 (0.86–0.99), and an AUC of 0.84 (0.80–0.87).
Conclusion: This study externally validates an AI-driven X-ray analysis tool for opportunistic identification of individuals at very high bone fragility risk. The tool demonstrated robust performance and enhanced applicability for opportunistic screening considering its reduced false positive rates, in both a homogenous European cohort and an ethnically diverse U.S.-based cohort. Further validation will establish the tool's ability to predict fracture risk and treatment decision-making.

Cohort	Age (years)	BMI (kg/m²)	Very High Risk* (%)	Accuracy (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)	AUC (95% CI)
Internal Test n = 1,846	67.2 ± 10.4	25.3 ± 4.2	15%	0.86 (0.82-0.90)	0.76 (0.66-0.86)	0.87 (0.82-0.99)	0.88 (0.78, 0.98)
European Cohort n = 220	68.3 ± 11.3	26.8 ± 12.9	22%	0.83 (0.71-0.93)	0.56 (0.32-0.70)	0.92 (0.79-0.99)	0.86 (0.82-0.91)
U.S. Cohort n = 647	67.3 ± 9.8	28.5 ± 5.7	11%	0.87 (0.81-0.95)	0.50 (0.23-0.55)	0.92 (0.86-0.99)	0.84 (0.80-0.87)

*BMI: Body Mass Index, *Very High Risk: Lumbar Spine BMD T-score ≤ -2.5 and trabecular bone score (TBS) < 1.23.*
Table 1: Test and Validation Cohort Demographics and Performance Metrics of the X-ray AI- Bone Fragility Detection Tool

Disclosures: G Gatineau, M De Gruttola, K Hind and M Davies are employees of medimaps group SA, developers of TBS iNsight™ software. D Hans is co-owner of the TBS patent, has corresponding shares and is CEO at medimaps group.

OC18

COST-EFFECTIVENESS OF OPPORTUNISTIC OSTEOPOROSIS SCREENING USING CHEST RADIOGRAPHS WITH DEEP LEARNING IN GERMANY

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Objective: Deep learning models applied to chest radiographs can support opportunistic osteoporosis screening. This study evaluates the cost-effectiveness of this approach in German women aged 50 years and over.

Methods: A microsimulation Markov model estimated the cost per quality-adjusted life year (QALY) gained (€2024) for screening via chest radiographs with deep learning, followed by treatment, versus no screening and treatment. The patient pathways were based on the sensitivity and specificity of AI-enhanced radiographs and risk stratification per German osteoporosis guidelines. Women with a risk for vertebral or hip fracture below 5% received no treatment; those with 5–10% risk were prescribed alendronate, and those aged 65+ with risk >10% received sequential treatment starting with romosozumab. Assumptions and data were validated by a German clinical expert. Real-world medication persistence, realistic assumptions for probabilities of DXA examination post-screening detection and for treatment initiation rates were incorporated. Parameter uncertainty was analyzed through sensitivity analyses.

Results: Screening improved health outcomes, yielding more QALYs and fewer fractures while increasing treatment costs. The cost per QALY gained of opportunistic screening was estimated at €13,340 for all women aged 50+, well below the commonly accepted cost-effectiveness thresholds, which are generally in the range of €60,000. Optimizing follow-up, treatment initiation, and adherence enhanced cost-effectiveness, with dominance (higher QALYs at lower costs) achievable by halving medication non-persistence.

Conclusion: Opportunistic osteoporosis screening using chest radiographs with deep learning is a cost-effective strategy for German women aged 50+ under real-world conditions. Improving screening follow-up and medication adherence could further enhance cost-effectiveness and achieve dominance.

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OC19

RELATIONSHIP BETWEEN COMORBIDITY, PHYSICAL ACTIVITY AND FRAILTY DIFFER ACCORDING TO EDUCATIONAL ATTAINMENT: FINDINGS FROM THE SOUTHAMPTON LONGITUDINAL STUDY OF AGEING (SALSA)

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Objectives

Comorbidity is common among older adults and is known to be related to lower physical activity and increased risk of developing frailty. However, there is a paucity of research exploring the effect of education on these associations. We aimed to explore the potential interation effect of educational attainment on the relationship between comorbidity, physical activity and frailty among community-dwelling older people.

Methods

A cross-sectional analysis was conducted on 513 community-dwelling older participants aged 75-96 identified from primary care, who completed a questionnaire which ascertained educational attainment attainment (university degree/Higher National Diploma/higher professional qualifications vs not), number of comorbidities and physical activity. Participants with ≥ 3 of the following were regarded as living with frailty: lost more than 10 lb unintentionally in the past year; self-reported exhaustion in the past week (≥3 days); low physical activity (bottom sex-specific fifth of the distribution); low self-reported walking speed (very slow or unable to walk); or difficulty carrying 10 lb (a lot of trouble or unable). Body mass index (BMI) was calculated from self-reported height and weight. Number of comorbidities in relation to physical activity and frailty was examined using linear and logistic regression respectively, with stratification by educational attainment. Men and women were pooled, and all analyses were adjusted for age, sex, BMI and smoking status.

Results

Median (lower quartile, upper quartile) number of comorbidities was 2 (1, 3) among both men and women; 17 (7%) men and 42 (15%) women had frailty. Standard deviation differences in physical activity scores (95% CI) per unit increase in number of comorbidities were greater among less educated participants (-0.09 [-0.15, -0.03], p=0.006) compared to more educated participants (-0.02 [-0.17, 0.14], p=0.826). Similarly, odds ratios (95% CI) for frailty per unit increase in number of comorbidities were greater among less educated participants (1.39 [1.13, 1.72], p=0.002) compared to more educated participants (1.17 [0.69, 1.98], p=0.552).

Conclusions

The detrimental effects of multimorbidity on physical activity and risk of developing frailty may be greater among less educated participants. These findings suggest that multimodal health and wellbeing intervention strategies coordinated across the primary-secondary care interface could be targeted to this vulnerable group of older people.

OC20

RELATIONSHIPS BETWEEN CHANGE IN SEX HORMONES WITH CHANGE IN MEASURES OF SARCOPENIA: A LONGITUDINAL STUDY IN COMMUNITY DWELLING OLDER MEN

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Objective Assess longitudinal associations between changes in sex hormones and changes in measures of sarcopenia in older men.

Methods Men in the MrOS study had sex hormone (SH) measures and were followed for 14±0.6 years for changes in DXA lean mass and assessments of physical performance. At baseline, 1718 men (age 73±6) had SH measures, and 437 had measures at the end of follow-up (age 83.4±3.5). Steroids were assayed by GC/MS and SHBG by chemiluminescence. Physical performance and activity were assessed by validated methods. To assess associations of SH change with change in measures of sarcopenia, standardized SH values were used in mixed effects linear models adjusted for potential confounders (age, site, height, weight, alcohol use, high medication use, diabetes, hypertension, smoking history, eGFR, cardiovascular disease and self-reported health). Results are reported as the change in the outcome measure per 1 standard deviation (SD) change in the SH measure.

Results During year 14 of follow-up, there were declines in lean mass and all measures of physical performance, and simultaneous declines in mean total testosterone (TT), estradiol (E2), and estrone (E1), while SHBG increased. In the fully adjusted model, greater decline in TT was associated with greater loss in total lean body mass (tLBM) (0.27 kg/SD; 95% CI: 0.07, 0.5), appendicular skeletal lean mass (aSLM) (0.15 kg/SD; 0.04, 0.3) and grip strength (0.49 kg/SD; 0.2, 0.8); increase in SHBG with declines in chair stands (0.07 per 10 seconds/SD; 0.01, 0.14) and 6m walk speed (0.01 m/s/SD; 0.005, 0.02); decline in E1 with greater loss of tLBM (0.21 kg/SD; 0.02, 0.4), aSLM (0.18 kg/SD; 0.07, 0.3) and with increase in 6m walk speed (0.01 m/s/SD; 0.001, 0.02); decline in E2 with lesser loss in PASE (3.08/SD; 0.3, 5.9).

Conclusion There were small but significant associations between longitudinal change in SH levels and decreases in lean mass and physical performance, supporting that the development of sarcopenia in older men is related to changes in total testosterone, with some associations with SHBG, E1 and E2. These results add to the body of evidence regarding the complex interaction between sex hormones, aging and sarcopenia.

OC21

OSTEOSARCOPENIA AS A RISK FACTOR FOR DEPRESSION: LONGITUDINAL FINDINGS FROM THE SHARE STUDY

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BACKGROUND: Osteosarcopenia (i.e., the co-existence of osteoporosis and sarcopenia) and depression are highly prevalent among older people. However, the association between osteosarcopenia and depression in older people is largely unknown. Therefore, the present study aims to investigate this possible association in a representative sample of the older adult population in Europe and Israel.
METHODS: The present analysis used data from multiple waves of the SHARE study. Osteosarcopenia was defined as the concomitant presence of osteoporosis and sarcopenia; depressive symptoms in the SHARE study were self-reported using the EURO-D scale. The association between the presence of osteosarcopenia at baseline in people free from depression and incident depression during 12 years of follow-up was analyzed using a Cox's regression analysis, adjusting for several baseline covariates.
RESULTS: 16,452 participants were included (mean age 63.7, SD 9.6; females 50.6%). During the follow-up period, 5,056 participants (31.1% of the initial population) became depressed. People affected by osteosarcopenia became depressed in more than half of the cases compared to a quarter of controls. After adjusting for several potential baseline confounding variables, only sarcopenia (HR, hazard ratio=1.17; 95% CI, confidence intervals 1.04-1.32; p=0.009) and osteosarcopenia (HR=1.27; CI 95% 1.12-1.58; p=0.003) were significantly associated with a higher risk of depression.
CONCLUSIONS: The present study identified a significant association between osteosarcopenia and depression over 12 years of follow-up. If future research confirms the present findings, it may then be prudent to target those with osteosarcopenia to aid in the prevention of onset depression.

OC22

PSYCHOMETRIC PROPERTIES OF THE SARQOL QUESTIONNAIRE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction: Sarcopenia, defined by the age-associated loss of skeletal muscle mass and function, significantly affects health-related quality of life (HRQoL). While the Sarcopenia and Quality of Life (SarQoL) questionnaire is recognized as the only disease-specific patient-reported outcome measure (PROM) for assessing sarcopenia-related HRQoL, a comprehensive quantitative evaluation of its psychometric properties is still lacking.
Objective: This systematic review and meta-analysis aimed to provide a quantitative summary of all evidence reported on the reliability, validity, responsiveness and floor/ceiling effects of SarQoL in older adults.
Methods: PRISMA-COSMIN guidelines for reporting systematic review of outcome measure instruments were followed. A systematic search for studies evaluating psychometric properties of SarQoL (i.e., reliability, validity, responsiveness and floor and ceiling effect) in older people was conducted on MEDLINE (via OVID), PsycINFO, Scopus and EMBASE. Studies published between 2013 and November 2024 in which individuals were diagnosed as being sarcopenic based on a consensual definition of sarcopenia. Study selection and data extraction were made by two independent reviewers. The COSMIN risk of bias tool was used to assess the methodological quality of the studies and summarize the psychometric properties of each tool. A random-effects model was applied for meta-analyses and subgroup and sensitivity analyses were performed to explore potential sources of heterogeneity and to assess the robustness of the findings.
Results: The systematic search identified 411 studies of which 25 fulfilled the inclusion criteria, including 4585 individuals of which 1311 were diagnosed sarcopenic. SarQoL demonstrated high reliability, with pooled Cronbach's alpha values consistently exceeding 0.80, and excellent test-retest reliability (ICC = 0.98). Validity assessments showed strong convergent correlations ($r > 0.54$) with related dimensions of generic SF-36 and EQ-5D, and weaker divergent correlations ($r < 0.47$), confirming construct validity. No floor or ceiling effects were observed, indicating an adequate range of response options. Responsiveness, evaluated in two studies using different methodologies, supported the ability of SarQoL to detect meaningful changes in HRQoL. The certainty of evidence was rated as high for reliability, validity and responsiveness.
Conclusion: SarQoL is a reliable and valid questionnaire for assessing HRQoL in sarcopenia. Its use, particularly among community-dwelling older individuals, for measuring HRQoL is highly reliable. This meta-analysis consolidates a decade of evidence and confirms the strong psychometric properties of SarQoL, with a high level of evidence.

OC23

BIOLOGICAL AGE-ACCELERATION ASSOCIATIONS WITH GRIP STRENGTH LEVEL AND LONGITUDINAL CHANGE: FINDINGS FROM THE HERTFORDSHIRE COHORT STUDY

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Objectives
Low grip strength is a key component of sarcopenia and is related to increased morbidity and mortality. DNA methylation accumulates across the lifecourse and biological clocks have been devised to measure age-acceleration (whether an individual is biologically older or younger than their chronological age). Of interest is whether age-acceleration measures could predict individuals at high risk of muscle deterioration. We examined epigenetic

age-acceleration measures in relation to baseline level and longitudinal change in grip strength in a cohort of community-dwelling older adults.

Materials and methods

Analyses were based on a sample of 333 participants from the UK Hertfordshire Cohort Study. At baseline (1998-2004), participants underwent detailed health assessments and provided blood samples. At baseline and follow-up (2011), grip strength was measured using a Jamar dynamometer; conditional change in grip strength (independent of baseline level) from baseline to follow-up was also derived. DNA was extracted from peripheral blood leukocytes and DNA methylation at CpG sites was measured using the Infinium Human Methylation Beadchip arrays (Illumina Inc., San Diego, CA). Various age-acceleration measures were then ascertained (PCPhenoAge, PCGrimAge, and bAge). Age-acceleration measures in relation to baseline and conditional change in grip strength were examined using sex-stratified linear regression. Models adjusted for chronological age, and those additionally adjusted for anthropometric, lifestyle and socioeconomic characteristics were implemented. Regression coefficients (95% CI) corresponding to the difference in baseline grip strength (kg) per standard deviation increase in age-acceleration measures are presented.

Results

At baseline, mean (SD) age was 65.1 (2.8) years. Among men, greater age-acceleration according to bAge was related to lower baseline grip strength regardless of adjustments used (-1.29 (-2.46,-0.12), p=0.03 in fully-adjusted analyses). After adjustment for chronological age, greater age-acceleration according to PCPhenoAge (-1.35 (-2.46,-0.25), p=0.017) and PCGrimAge (-1.25 (-2.33,-0.16), p=0.024) were related to lower baseline grip strength among men but these associations were not robust to further adjustment. Associations were much weaker regarding baseline grip strength among women, and for both sexes regarding conditional change in grip strength.

Conclusions

A sex difference was observed in the relationship between a measure of biological age-acceleration and grip strength. This finding demands further investigation in larger cohorts.

OC24

TREATMENT-RELATED CHANGES IN TOTAL HIP BONE MINERAL DENSITY AND FRACTURE RISK REDUCTION FOR TRIALS WITH ACTIVE CONTROL AND SEQUENTIAL THERAPY: THE FNIH-ASBMR-SABRE PROJECT

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Objectives

In the SABRE Study, we showed that treatment-related differences in 24-month total hip bone mineral density (THBMD) changes are strongly associated with reduced fracture risk in placebo-controlled trials. We also determined the surrogate threshold effect (STE): the minimum THBMD change in a trial that would predict a significant reduction in fracture risk in trials. However, the availability of osteoporosis therapies limits use of placebo-controlled trials, and the need to sustain bone mineral density gains after anabolic therapies leads to the use of sequential therapy. This analysis aimed to determine if these associations and STEs apply to trials using active control or sequential therapies.

Material and methods

We used individual patient data from 19 trials: 16 randomized, placebo-controlled trials (14 anti-resorptive, 1 teriparatide, 1 odanacatib), and 3 trials with active control or sequential therapy (1 abaloparatide/alendronate and 2 romosozumab/alendronate or denosumab).

For each trial, we calculated the treatment-related difference in mean percentage change in THBMD at 24 months and the risk reductions for the entire follow-up period. We used logistic regression for radiologic vertebral fractures and Cox regression for all clinical fractures (combination of non-vertebral and clinical vertebral fractures). We performed linear meta-regression to estimate the study-level association (r^2 and 95% CI) between treatment-related differences in THBMD changes and fracture risk reduction, including the 16 placebo-controlled trials only and all the trials including 3 active control/sequential therapy trials and verified if the change in THBMD observed in the trials with active control or sequential therapy was greater than the STE calculated from placebo-controlled trials.

Results

We found consistent associations between treatment-related THBMD changes and fracture risk reduction for placebo-controlled trials only and all trials for vertebral fractures [r^2 (CI)= 0.73(0.33,0.84)vs.0.71(0.36,0.82)] and for all clinical fractures [0.71(0.32, 0.83)vs.0.72(0.39,0.83)] respectively. In trials with active control or sequential therapy, increase in THBMD was greater than STE and associated with a significant decrease in fracture risk (Table).

Conclusion

Our findings show that treatment-related changes in THBMD predict anti-fracture efficacy equally well, regardless of the trial design.

Table Validation of STE estimates in the 3 active controlled/sequential treatment trials. Each cell shows the OR or HR for fracture reduction and the 95% confidence interval. In the three trials, the mean THBMD % change was greater than the STE, in agreement with the significant fracture reduction observed.

Study	TH BMD % difference (95% CI)	Fracture risk reduction OR or HR (95% CI)	
		Vertebral	All clinical
		STE: 1.43	STE: 2.04
FRAME (Romo/Dmab)	4.57 (3.93, 5.21)	0.26 (0.16, 0.41)	0.66 (0.51, 0.84)
ARCH (Romo/ALN)	3.69 (3.33, 4.06)	0.50 (0.38. 0.64)	0.73 (0.61, 0.88)
ACTIVEXTEND (Abalo/ALN)	3.12 (2.92, 3.32)	0.15 (0.06, 0.40)	0.66 (0.44, 0.99)

Romo romosozumab; Dmab denosumab; ALN alendronate; Abalo abaloparatide

OC25

THE PREVALENCE OF VERTEBRAL FRACTURES AND ASSOCIATED FACTORS IN THE GAMBIA, ZIMBABWE AND SOUTH AFRICA

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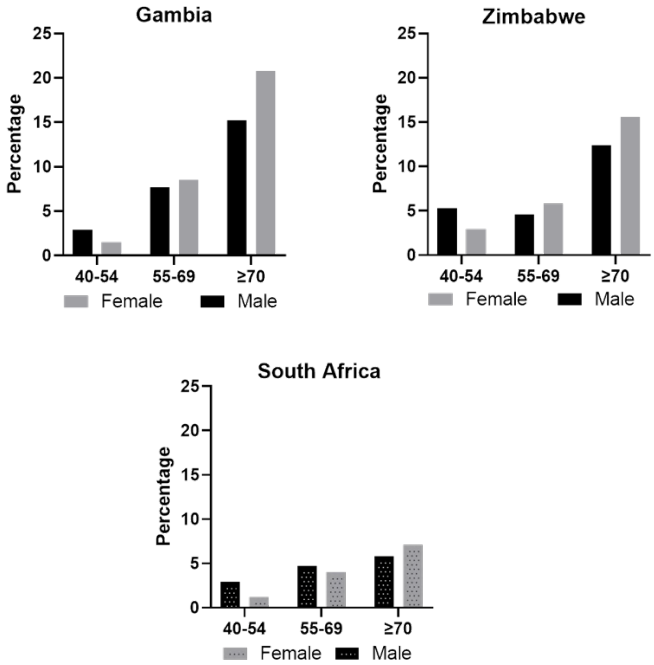
Objective: To determine the prevalence and associated factors for vertebral fractures(VF) in females and males in the Fractures-E3 study[1].

Methods: A population-based, cross-sectional study of community dwelling adults was conducted across three urban sites; Harare, Zimbabwe; Brufut/Sukuta, The Gambia; Kwamashu, South Africa (SA). Recruitment was stratified by sex and age (40-54, 55-69, ≥70 years). Prevalence of VF was determined using Genant semi-quantitative assessment on iDXA images in The Gambia and Zimbabwe, and algorithm-based-quantitative (ABQ)-method on lateral thoracic/lumbar spine radiographs in SA. Demographic and clinical factors were compared in those with and without prevalent VFs, by country and sex. Logistic regression determined associations between clinical factors and VF.

Results: The prevalence of VF was: 4.2% (M:4.3%, F4.1%) in SA (n=962), 8.0% (M:7.5%, W:8.4%) in Zimbabwe (N=1067), and 9.8% (M:8.5%, F:10.9%) in The Gambia (n=1130). In those aged ≥70y, prevalence was greatest in women; 20.8% (Gambia), 15.6% (Zimbabwe), 7.1% (SA). However, overall sex was not a risk factor for fracture. Increasing age was associated with presence of VF in all countries (odds ratios [95% confidence intervals] Gambia 1.07[1.05,1.09] per year; Zimbabwe 1.05[1.02,1.07]; SA 1.05[1.02,1.07]) as was prior adult fracture (Gambia 2.29[0.96,5.47]; SA 2.28[1.18,4.41]; Zimbabwe 2.18[1.15,4.13]). In The Gambia glucocorticoid use was associated with VF (3.25 [1.78,5.94]). Increasing BMI in SA (0.95[0.91,1.00]) and Zimbabwe (0.96[0.92,1.00]) was associated with lower odds of having a prevalent VF. In both countries, approximately 25% females had a T-score<-2.5 and 13% males.

Conclusion: VFs are common in African populations. Given the rising ageing population in countries with limited and stretched healthcare resources, it is important to understand further context-specific factors associated with fragility fractures such as bone trauma in the young, malnutrition, and HIV.

References: [1] Burton et al. 2023. https://wellcomeopenresearch.org/articles/8-261/v1



OC26

ENHANCING FRACTURE RISK PREDICTION: A COHORT-SPECIFIC MODEL INTEGRATING FRAXPLUS® VARIABLES FOR IMPROVED ACCURACY AND RECLASSIFICATION

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Objectives

The FRAXplus® tool provides adjustments for individual fracture risk factors not currently incorporated into FRAX, but only allows adjustment of FRAX probabilities for one FRAXplus® risk factor at a time. To overcome this limitation, we developed a cohort-specific model that integrates all FRAXplus® variables to more comprehensively predict major osteoporotic fractures (MOF) and hip fractures. This study aimed to evaluate the predictive accuracy

and reclassification performance of a cohort-specific multivariable model, both with and without adding FRAXplus® variables, for estimating 10-year fracture risk.

Methods

Using data from the SUPERB cohort of (n=3028), women aged 75-80 years, we developed two 10-year probabilities based on modified Poisson regression models: one based solely on FRAX risk factors and the other augmented with FRAXplus® variables. Clinical risk factors (CRFs) were collected via questionnaires and incident fractures captured using a regional x-ray archive over eight years of follow-up. Model performance was assessed using the area under the curve (AUC) and net reclassification improvement (NRI). Ten-year fracture probabilities were calculated for MOF and hip fractures, with participants reclassified according to MOF probability intervention threshold (IT) ≥26%.

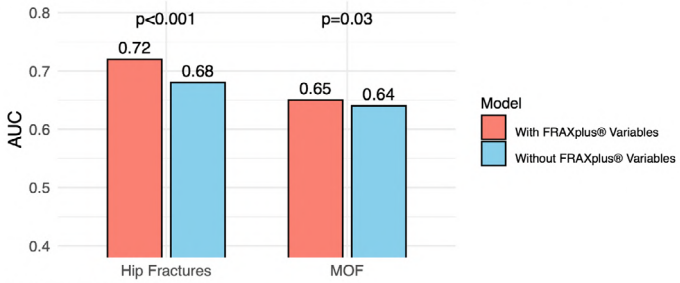
Results

Incorporating FRAXplus® variables significantly improved the model's predictive performance. For hip fractures, the AUC increased from 0.68 to 0.72 (p<0.001), and for MOF, the AUC improved from 0.64 to 0.65 (p=0.03). Reclassification analyses demonstrated significant NRI improvements of 2.6% (p=0.025) for MOF. Under the new model with FRAXplus® adjustments, 113 women had their 10-year probabilities reclassified above the IT: of these, 30 (26.55%) experienced fractures. Meanwhile, 159 women were reclassified below the IT, and among them, 27 (16.98%) experienced fractures.

Conclusions

The cohort-specific multivariable model incorporating FRAXplus® variables significantly enhances fracture risk prediction and reclassification compared to models with only the original FRAX model parameters. These findings highlight the benefit of FRAXplus® risk factors which may guide future iterations of the FRAXtool.

Cohort Specific Model With and Without FRAXplus® Variables



AUC: Area Under the Curve

OC27

ENGAGEMENT WITH AND TOLERABILITY OF AUGMENTED REALITY (AR) EXERGAMES AMONG OLDER WOMEN WITH OSTEOPOROSIS: RESULTS FROM A CLINICAL TRIAL

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Background

Physical therapy is a proven intervention to reduce fall and fracture risk among people with Osteoporosis. To address engagement challenges with traditional therapy, virtual rehabilitation using exergames has emerged as a promising solution.

Purpose

To assess the tolerability of and engagement with augmented reality (AR) exergames among postmenopausal women with osteoporosis.

Methodology

We developed 4-bespoke AR exergames where virtual objects are overlaid on the real-word from active-videogames to create interactive physical activity experiences. These games (i.e. sit-to-stand, squat, arm-raises and step-up) were aligned with an approved physical therapy programme for osteoporosis patients and will be demonstrated during an oral presentation. A Phase I-II clinical trial was conducted over 8 weeks to assess safety, tolerability and change in function. Phase I included feedback about discomfort and motion sickness from all participants, while Phase II included feedback from the Intervention cohort concerning exergame engagement. The Intervention group used a Microsoft HoloLens-2 headset and a body-tracking camera to interact with virtual objects whose visual elements evolved weekly, based on participant feedback. Real-time visual and auditory feedback provided cues, motivation, and posture corrections. The Control group followed a traditional exercise programme comprising the 4 exercises.

Results

In Phase I, 65% of all participants reported no motion sickness and 81% no discomfort. Discomfort was generally described as mild pressure over the upper body (Figure 1). In Phase II, 41 women aged 60-86years attended bi-weekly, 20-minute sessions for 6-weeks: 21 control and 20 intervention. Fewer than 10% experienced AR previously. No patient died. 85% of the Intervention group reported enjoying the exergames.

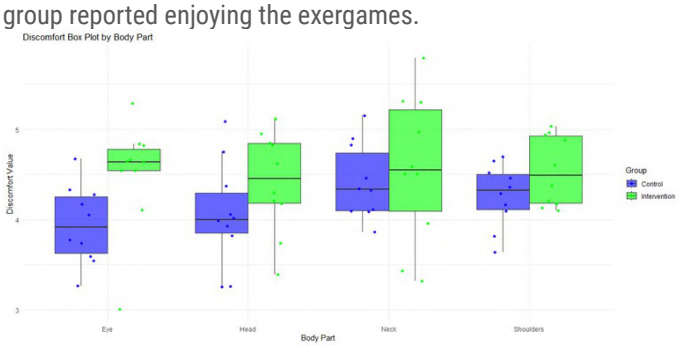

Figure 1: Discomfort

Conclusion

AR exergames were acceptable, enjoyable, and well tolerated among older women with osteoporosis. This innovative approach could improve engagement with and adherence to physical therapy. Larger clinical trials are needed to assess their effectiveness

in clinical practice.

OC28

EFFECTS OF ANTIDIABETETIC TREATMENTS ON FRACTURE RISK

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Objectives: Treatments for type 2 diabetes (T2D) may exert both direct and indirect effects on bone, with potential implications on fracture risk. While insulin and thiazolidinediones have been associated with increased fracture risk, limited information exists about the effects of metformin and, to a greater extent, the most recent oral antidiabetic drugs (OADs), i.e. GLP-1 receptor agonists (GLP-1ra) or SGLT-2 inhibitors (SGLT2i). We assessed the effects of different antidiabetic treatments, alone or in combination, on fracture incidence in an outpatient cohort.
Methods: 403 T2D patients were followed from the baseline visit to the date of fracture event; subjects without fracture were censored at the end of follow-up. After a mean follow-up of 9 years, a total of 154 incident nontraumatic fractures (42 vertebral, 112 nonvertebral) were observed in 95 patients. Cox proportional regression models were used to examine the relationship of any treatment with incident fractures, with results presented as hazard ratios (HRs) and 95% CIs.
Results: Patients under insulin treatment showed the highest fracture incidence (reaching 54% at 9yrs) as compared with patients on OADs, equivalent to a HR of 1.88 (95% CIs, 1.15–3.05; p =0.01). Conversely, insulin treatment associated with OADs did not confer increased fracture risk versus OADs treatment alone (HR 1.24; 95% CIs 0.66–2.32). Among the different OADs, both metformin (HR 0.47; 95% CIs 0.30–0.75; p<0.005) and SGLT2i (HR 0.19; 95% CIs 0.05–0.81; p<0.05) were associated with decreased fracture incidence with respect to insulin treatment. All the HR levels remained statistically significant after controlling for covariates (diabetes duration and T2D complications). Moreover, the association between GLP-1Ra and SGLT2i (with or without metformin) was associated with the lowest fracture incidence (5.9%) among the different treatment regimens, albeit the HR did not reach the statistical significance, likely due to the limited number of cases (HR 0.17; 95% CIs 0.02–1.25; p=0.08).
Conclusions: These results further suggest the use of OADs such as metformin and SGLT2i (alone or in combination) over insulin treatment to reduce fracture risk in T2D patients.

OC29

GLP-1 RECEPTOR AGONISTS AND RISK OF BONE FRACTURES IN ELDERLY PEOPLE WITH TYPE 2 DIABETES

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Objective: To assess the risk of fractures associated with glucagon-like peptide 1 receptor agonists (GLP-1 RA) therapy compared to sodium-glucose cotransporter-2 inhibitors (SGLT-2i) or dipeptidyl peptidase-4 inhibitors (DPP-4i) therapy in elderly people with type 2 diabetes.
Methods: This nationwide, population-based, cohort study included individuals with type 2 diabetes, ≥ 65 years, who initiated GLP-1 RA therapy or one of the comparators during January 2018–October 2022. The primary outcome was the first incident of vertebral, hip, pelvic, humerus, forearm or rib fracture. Anthropometric and clinical characteristics of patients, including osteoporosis and risk factors for fractures, were extracted from the electronic database. People were followed until fracture, death, or March 2024. After adjusting for propensity score, hazard ratios (HRs) with 95% confidence interval (CI) were estimated using stepwise Cox models, and the Fine-Gray model for competing risks. Subgroup analyses by age, sex, ethnicity, BMI, and osteoporosis were performed.
Results: Among 45,222 people, 73.0±6.4 years, 50% female, 66.5% were 65-75 years and 31.3% ≥75 years. During a median follow up of 35.3 (interquartile range 24.7-48.0) months, 3,618 (8.0%) had an incident fracture. Among 11,061 new users of GLP-1 RA and 34,161 of the comparator drugs, the overall incidence of fractures was comparable between groups ((2.82 (95%CI 2.63-3.02) vs. 2.75 (95%CI 2.65-2.85)), p=0.53, respectively, per 100 person years. In multivariate analysis for osteoporotic fractures (adjusted for multiple risk factors), initiating GLP-1 RA was associated with a 12% increased risk for bone fractures compared to the control group (HR 1.12, 95%CI 1.03-1.23, p=0.006). Repeating the analysis for competing risks, along with conducting various subgroup and sensitivity analyses, yielded results consistent with those of the main analysis.
Conclusions: Initiation of GLP-1 RA therapy was associated with an increased risk of incident fractures compared to SGLT-2i and DPP-4i, among elderly individuals with type 2 diabetes.

OC30

EFFECTS OF A REMOTELY-DELIVERED FUNCTIONAL RESISTANCE AND IMPACT TRAINING PROGRAM VERSUS WALKING ON PHYSICAL FUNCTION IN OLDER ADULTS WITH OBESITY UNDERGOING CALORIC RESTRICTION: A 6-MONTH RANDOMISED CONTROLLED TRIAL

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Objective: To compare the effectiveness of a 6-month remotely-delivered, home-based functional resistance and impact training (FIT) versus structured walking (control) program for improving physical function in older adults with obesity undergoing caloric restriction (CR).

Material and Methods: Community-dwelling adults (n=116) aged ≥60 years with self-reported obesity (BMI ≥30 kg/m^2) and increased risk for sarcopenia (SARC-F score ≥2) commenced a 6-month CR intervention (750-1000 kcal restriction from habitual intake via dietary modification) delivered by an Accredited Practicing Dietitian using the Physitrack® smartphone app and telephone consults. Participants were randomised for 6 months to FIT (3-5 sessions/week of home-based muscle strengthening and weight-bearing impact exercises) or control (targeting 150 min/week of walking activity), delivered and monitored by an Accredited Exercise Physiologist using Physitrack®. The primary outcome was change in muscle power, determined by vertical jump power assessment using a ground reaction force platform. Secondary outcomes included changes in stair-climb power, 5x sit-to-stand time, gait speed, and Short Physical Performance Battery (SPPB) scores.

Results: At baseline, mean±SD age and BMI were 66.4±3.9 (range 60-84) years and 35.6±4.6 kg/m^2 respectively, and 74% of participants were female. During the 6-month intervention, 24 of 59 (41%) FIT and 18 of 57 (32%) controls were lost to follow-up, primarily due to loss of interest and illness. Intention-to-treat analyses demonstrated that mean body weight decreased significantly for both FIT (-2.3 kg; 95% CI -3.7, -1.0; P<0.001) and control (-1.7 kg; 95% CI -3.0, -0.5; P=0.006), with no difference between groups (P=0.508). Vertical jump power increased significantly for FIT (0.88 W/kg; 95% CI 0.19, 1.58; P=0.014) but not control (0.03 W/kg; 95% CI -0.63, 0.68; P=0.937) but these changes were not significantly different (P=0.079). Stair climb power also improved for FIT only (0.39 W/kg; 95% CI 0.17, 0.61; P<0.001), while sit-to-stand time, gait speed and SPPB scores improved in both groups (all P<0.05).

Conclusions: In older adults with obesity undergoing CR, FIT similarly improved physical function compared to walking. These findings should be interpreted cautiously given the high attrition observed which may raise concerns regarding the feasibility of these remotely-delivered exercise and weight loss interventions in this population.

OC31

MATERNAL BONE MINERAL DENSITY AT 4 YEARS POST-DELIVERY IS NOT AFFECTED BY PREGNANCY VITAMIN D SUPPLEMENTATION

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Objectives

Mobilisation of the maternal skeleton during pregnancy and lactation ensures calcium is available for the fetus. There is evidence that pregnancy vitamin D supplementation increases offspring bone mineral density (BMD) in childhood, but there is limited data on the effect on maternal BMD. We assessed the effect of pregnancy vitamin D supplementation on the maternal skeleton in the medium term.

Materials and Methods

MAVIDOS was a randomised placebo-controlled trial of 1000 IU/day cholecalciferol (vitD) from 14-17 weeks gestation until delivery. Participants were invited to have a Dual-Energy Xray absorptiometry (DXA) scan of the whole-body (analysed less head: WBLH), lumbar spine (LS) and left hip at 4 years postpartum. A subset of the women also had a DXA scan within 2 weeks of delivery.

BMD at 4 years post-delivery was compared between groups using linear regression in unadjusted and adjusted (maternal age, further pregnancy, duration of lactation, height and weight) models. β (95%CI) represents the effect of vitD compared to placebo. In women with DXA at both time points, the effect of vitamin D was assessed using mixed effects modelling to account for repeated measures.

Results

443 (225 placebo, 218 vitD) participants had a DXA scan at 4 years post-delivery. BMD did not differ between the two randomization groups in unadjusted or adjusted analyses (adjusted WBLH β=0.000 (0.012, 0.012) g/cm^2; LS β=0.009 (-0.010, 0.027) g/cm^2; hip β=0.004 (-0.014, 0.022) g/cm^2).

223 women had DXA at birth and 4 years. In both randomisation groups, BMD increased from birth to 4 years post-delivery (placebo WBLH 6.3%, LS 1.2%, hip 2.2%; VitD WBLH 6.2%, LS 1.0%, hip 2.4%, p<0.05 for all). However, the randomisation group had no effect on BMD (p>0.05 for all).

Conclusions

Despite previously demonstrated benefits for the offspring skeleton, pregnancy supplementation with 1000 IU/day cholecalciferol did not have an effect, either positive or negative, on maternal BMD at 4 years post-delivery.

OC32

USING PROBIOTICS TO SUPPORT BONE HEALTH IN POSTMENOPAUSAL WOMEN: A RANDOMIZED, DOUBLE-BLIND, PARALLEL, PLACEBO-CONTROLLED, MULTI-CENTRE STUDY

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Objective: To determine if a probiotic supplement could attenuate the loss of femur neck bone mineral density (FN BMD) and to assess its effect on fracture risk and markers of bone cell activity. *Material and Methods*: 72 postmenopausal women (40-59 years, not receiving pharmacotherapy for bone health) were randomized to receive a daily probiotic supplement or placebo for 48 weeks. FN BMD (DXA) and fracture risk (FRAX® assessment tool) were assessed at weeks 0 and 48. Serum bone markers (procollagen type 1 N-terminal propeptide, P1NP; bone-specific alkaline phosphatase, BAP; cross-linked C-telopeptide of type I collagen, CTx; osteocalcin, OC) were analyzed at weeks 0, 12, 24 and 48. *Results*: There was no significant time by treatment interaction for FN BMD or fracture risk. Independent of treatment group, FN BMD decreased (p = 0.034), while risk of hip (p = 0.003) and major osteoporotic fracture (p = 0.044) increased. Time by treatment interaction was significant for serum P1NP (p = 0.003) and CTx (p = 0.006) but not for serum BAP and OC. At week 12, serum P1NP was higher in the placebo group than the probiotic group (p = 0.008). Compared to baseline, serum P1NP increased in the probiotic group at week 24 (p = 0.006) and decreased in the placebo group at week 48 (p = 0.007). CTx increased over time with probiotics (p = 0.006). At endpoint, serum CTx was higher in the probiotic group than the placebo group (p = 0.008). Independent of treatment group, serum OC (p = 0.006) and BAP (p = 0.007) increased at weeks 24 and 48, respectively. *Conclusion*: Probiotics did not alter FN BMD or fracture risk, but the increase in bone cell activity suggests an opportunity to further examine the dose and duration of this novel combination of bacteria strains for supporting bone health in postmenopausal women.

Disclosures: SB and VN are employees of Lallemand Health Solutions that provided the investigational products and funding for the study. JLY received a Mitacs Accelerate Award.

OC33

RELATIONSHIPS BETWEEN MICRORNAS AND CORTICAL BONE IN CHRONIC KIDNEY DISEASE

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Objectives: Cortical (Ct) bone disease is a critical feature of renal osteodystrophy (ROD). However, most published histomorphometric data on the skeletal effects of kidney disease (KD) are based on trabecular (Tb) bone. ROD is defined by bone turnover (i.e., low, normal, high), and identification of ROD-type by bone turnover markers has been developed in the context of Tb turnover. Thus, knowledge gaps remain for our ability to assess Ct changes in KD – which drive the skeletal phenotype. In our prior work in a small cohort of patients with KD (JBMRplus 2020), we found that microRNAs identified Ct ROD-type and outperformed protein-based bone turnover markers. We validated our findings for Ct bone in a multi-ethnic cohort of 98 men and women across the spectrum of KD from the United States and Brazil.
Methods: Adults with KD underwent tetracycline double-label bone biopsy with quantitative histomorphometry. Blood at biopsy was stored at -80C for batch assay. Single reader histomorphometry was conducted. miRs-30b, 30c, 125, 155, 331 and 1299 were assayed based on our prior work. Comparisons between miRs, CKD Stage, and Ct bone formation (BFR %/yr) were determined. Diagnostic characteristics for low Ct turnover were determined with ROC and logistic regression analyses.
Results: The cohort was 52% female, with mean(SD) age 54(14) years. 51%, 30%, 18%, and 1% self-defined White, Mixed, Black and Asian race respectively. 28%, 23% and 49% had CKD stages 2-3, 4-5 and 5D respectively. Ct turnover in CKD5D was higher than in CKD2-3 and CKD4-5 ($p<0.05$ for both). All miR levels were lower in CKD5D then in CKD2-3 and CKD4-5 ($p<0.05$ for all). Correlations were significant between miRs-30c and -331 and Ct BFR (-0.21 and -0.21, $p<0.05$ for both). In ROC analyses, all miRs except 1299 discriminated low Ct turnover with positive predictive values (PPV) of 90% for miR-30b and -331 (table). Optimization of the AUC cutpoint for low Ct turnover and inclusion of miR-30b, 30c, 125 and 331 into a multivariable logistic regression model had an AUC 0.75 ($p< 0.05$) and a PPV 91%.
Conclusion: miR levels were related to Ct turnover from histomorphometry and discriminated low Ct turnover in a multi-ethnic cohort of patients with KD. Future work will optimize the models in conjunction with bone turnover markers.

Area Under Curve (AUC) for miRs and Low Ct Bone Turnover (BFR %/yr)

	AUC	p-value	Positive Predictive Value
miR-30b	0.71	<0.05	90%
miR-30c	0.74	<0.05	89%
miR-125	0.68	<0.05	81%
miR-155	0.62	<0.05	79%
miR-331	0.71	<0.05	90%
miR-1299	0.59	NS	78%
miR-30b, 30c, 125, 331	0.75	<0.05	91%

OC34

FRAGILITY FRACTURES MANAGEMENT IN PREGNANCY BY REMS TECHNOLOGY: THE PREGNANCY OSTEOPOROSIS INITIATIVE (POI)

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Objective(s): Pregnancy-associated osteoporosis (PAO) is characterized by reduced bone mineral density (BMD) and fragility fractures, typically manifesting in the third trimester of pregnancy. This condition arises from increased foetal calcium demands, leading to maternal bone resorption. Despite its clinical significance, PAO is often underdiagnosed due to the limitations of ionizing techniques like DXA (Dual-energy X-ray Absorptiometry), highlighting the need for early diagnosis and timely intervention. This study aims to evaluate calcium intake, dietary habits, and fracture risk (FR) factors during pregnancy, while monitoring bone health using ultrasound REMS (Radiofrequency Echographic Multi-Spectrometry) technology to identify skeletal fragility and prevent fractures.

Material and Methods: This prospective, longitudinal, multicenter study will allow the recruitment of women aged 18-45 y in their first trimester of pregnancy. Participants will complete two validated questionnaires, Predimed and AFEF, developed by the Observatory of Fractures from Fragility (OFF Italy), to assess dietary calcium intake, adherence to the Mediterranean diet, and FR factors. Bone health will be monitored using REMS technology, focusing on the femoral neck at three time points: the first and third trimesters of pregnancy and six months postpartum.

Results: The results of the study will stratify participants in two groups based on BMD: low and normal values. For each group, variations in bone quality and fragility will be assessed by defining a pregnancy-specific REMS -based Fragility Score cut-off to estimate fracture risk and prevent their occurrence.

Conclusion(s): This study will enhance understanding of the underlying primary factors of related to PAO and provide actionable insights into dietary and clinical predictors through the development of a dedicated FR chart. By utilizing targeted questionnaires and REMS technology, it aims to facilitate early diagnosis and effective management strategies, ultimately reducing FR in pregnant and breastfeeding women.

OC35

INTERACTIONS BETWEEN CALCIUM AND PROTEIN INTAKES, AND OSTEOPOROSIS MEDICATIONS ON HIP BONE STRENGTH: AN OBSERVATIONAL STUDY IN OLDER WOMEN

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Objective: Osteoporosis medications (OM) are commonly prescribed with calcium supplements (CaS), without considering dietary factors, including calcium and protein adequacy. Their efficacy without concomitant CaS is largely undocumented. We explored whether changes in hip bone strength in response to OM are influenced by CaS use, dietary calcium and protein intakes.

Methods: We included data from older women (n=586, age mean±SD: 67±2 years) from the Geneva Retirees Cohort taking hormone replacement therapy (HRT, n=101) bisphosphonates/denosumab/raloxifene (BPs/D/R, n=67) or no OM (n=418). Changes (%/year) of finite element-based hip bone strength and 3D DXA hip parameters were evaluated using the 3D-SHAPER software 2.9.0 over 3.4±0.5 years. Dietary calcium and protein intakes (food frequency questionnaire) and CaS use were evaluated at baseline and follow-up.

Results: Mean total calcium intake (diet + supplements) was 1552±533 mg/day, with 71% of women achieving adequate intakes (≥1200mg/day). Calcium and vitamin D supplements were used by 52% and 62% of women, respectively (no OM: 47/59%, HRT: 50/58%, BPs/D/R: 81/90%). Women on HRT or BPs/D/R had improved hip strength and most bone parameters compared to women without OM. There were no differences in changes of bone strength or other bone parameters in either of the 3 treatment groups in an analysis by total calcium intake (low vs. sufficient). No differences were observed within each treatment group according to CaS use, except for a trend towards an attenuated loss of hip strength in women without OM taking CaS. Among women taking no OM with low dietary calcium intake, the degradation of cortical surface BMD (p=0.071) and thickness (p=0.048) were greater in those without vs. with CaS. The decrease of hip strength was not attenuated by HRT in women with low dietary calcium intake and no CaS vs. those with CaS (p=0.067). The effects of BPs/D/R on hip trabecular vBMD (p=0.009) and strength (p=0.044) were attenuated in women with low (<0.8g/kg/day) vs. adequate protein intake.

Conclusion: In this observational study, women with adequate calcium intake had similar changes in hip bone strength and BMD with OM regardless of CaS. Bone changes were more linked to OM and protein intake interactions.

Table: Change of 3D-DXA hip strength expressed in % per year, median (interquartile range), according to osteoporosis medications

		No osteoporosis medication N=418	Menopause hormone therapy N=101	Bisphosphonate/ denosumab/raloxifene N=67
Total		-2.2% (-4.3%, -0.4%)	-1.4% (-3.2%, 0.0%)	-0.5% (-2.2%, 1.1%)
Total calcium intake (dietary + supplements)	<1200mg/d	-2.4% (-4.2%, -0.4%)	-2.1% (-4.3%, 0.4%)	-0.6% (-3.6%, 0.5%)
	≥1200mg/d	-2.1% (-4.2%, -0.4%)	-1.3% (-2.8%, 0.0%)	-0.5% (-2.1%, 0.9%)
	P-value	0.709	0.173	0.579
Calcium supplements	Yes	-1.7% (-4.0%, -0.3%)	-1.4% (-2.4%, 0.1%)	-0.5% (-2.2%, 0.7%)
	No	-2.6% (-4.3%, -0.4%)	-1.9% (-4.2%, -0.3%)	-0.5% (-2.0%, 1.6%)
	P-value	0.095	0.178	0.969
Calcium supplements if dietary calcium intake <1200mg/d	Yes	-1.9% (-3.9%, -0.2%)	-1.3% (-1.9%, 0.0%)	-0.6% (-2.4%, 0.7%)
	No	-2.4% (-4.2%, -0.4%)	-2.2% (-4.4%, 0.4%)	-0.7% (-3.6%, 0.5%)
	P-value	0.366	0.067	0.588
Protein intake	<0.8g/kg	-1.9% (-4.0%, 0.4%)	-1.4% (-5.1%, 0.4%)	-2.6% (-3.7%, -0.2%)
	≥ 0.8g/kg	-2.3% (-4.3%, -0.5%)	-1.4% (-3.2%, 0.0%)	-0.5% (-1.8%, 1.2%)
	P-value	0.19	0.954	**0.044**

OC36

A NATIONAL SURVEY OF AUSTRALIAN PRIMARY CARE CLINICIANS' KNOWLEDGE, BELIEFS, ATTITUDES, PRACTICES, PERCEPTIONS OF RESPONSIBILITY AND BARRIERS AND ENABLERS TO IDENTIFICATION AND MANAGEMENT OF SARCOPENIA

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Objective: Sarcopenia receives limited attention in primary care. This study aimed to explore general practitioners' (GPs) and practice nurses' (PNs) awareness, understanding, knowledge, beliefs, attitudes, practices, perceptions of responsibility, confidence, barriers and enablers to identification and management of sarcopenia.

Material and Methods: A national Australian, anonymous 33-item, online purpose-designed survey covering topics relevant to the study aims was undertaken from March to May 2024.

Results: Of 1364 respondents (97% GPs), 1141 (84%) completed all questions. Overall, 67% were somewhat/moderately familiar with the term sarcopenia and recognised it included low muscle mass (89%), muscle strength (66%) and poor function (53%), but 35% incorrectly identified 'low fitness' as a component. Knowledge on common signs/symptoms, risk factors, consequences, and treatments was high (82-99.7% correct response rate to 22/46 statements), but most did not recognise unrelated factors (only 10-18% recognised stiff/inflexible muscles, cramps and persistent muscle pain are not signs/symptoms) or ineffective treatment options (only 9-12% recognised any forms of exercise, aerobic exercise, and fruit/vegetable intake are ineffective treatments). Most clinicians (>80%) believed they should play an active role in sarcopenia identification/treatment, but only 23% currently screened/assessed for it, with 73% using a clinical assessment (mostly sit-to-stand), generally in patients with comorbidities, functional issues, malnutrition, and adults aged ≥60y. A high proportion (90%) indicated clinician education and screening/assessment (86%) should be prioritized in primary care, but 68% stated other factors were a higher priority, 47% had insufficient time, and only 23% had the confidence and knowledge to address sarcopenia in practice. Lack of referral options (56-62%) and access to appropriate tools (55-58%) were key barriers and protocol implementation and access to relevant training (81-84%) were the main enablers to identification/treatment.

Conclusion: Primary care clinicians in Australia are familiar with and have some intuitive understanding of, and positive attitudes and beliefs toward sarcopenia, but report it is not a priority and they lack knowledge, confidence, referral options, appropriate tools and time to address it in practice.

OC37

AUTOMATED ABDOMINAL AORTIC CALCIFICATION EXTENT IS ASSOCIATED WITH MUSCLE COMPOSITION, STRENGTH AND SARCOPENIA: THE UK BIOBANK IMAGING STUDY

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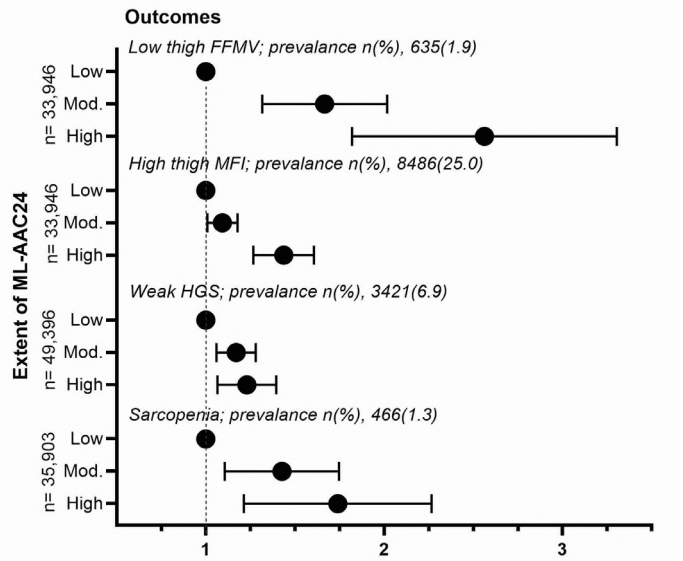
Objective(s): Abdominal aortic calcification (AAC) is associated with higher risk for cardiovascular events and can be identified

during routine osteoporosis testing on DXA-derived lateral spine images. Our automated machine learning algorithm assessing AAC (ML-AAC24) identifies individuals with higher fall and fracture risk [1]. However, the relationship between ML-AAC24 with muscle composition and strength, strong predictors of fracture risk, remain unclear. We examined if greater extent of ML-AAC24 is cross-sectionally associated with poorer measures of muscle composition, strength and sarcopenia in the UK Biobank Imaging Study.

Methods: ML-AAC24 extent was categorised as low (<2), moderate (2-5) and high (≥6). Magnetic resonance imaging-derived thigh fat-free muscle volume (FFMV) and muscle fat infiltration (MFI) was available in 33,946 people. Age and/or sex specific cut-points for low FFMV and high MFI were adopted (Fig). Muscle strength was assessed using hand grip strength (HGS, n=49,396). Muscle weakness (HGS <27 kg for male and <16 kg for female) and sarcopenia (low height-adjusted appendicular lean mass assessed from DXA and weak HGS, n=35,903) were categorised based on revised European guidelines. Logistic regression examined the associations between ML-AAC24 extent and the aforementioned muscle health measures.

Results: Participants mean age was 64.6 ± 7.8 years, 50.8% female. In multivariable-adjusted analysis, participants with moderate and high ML-AAC24 consistently had greater odds for having low FFVM, high MFI, weak HGS and sarcopenia, compared to those with low ML-AAC24 (Fig). Results were independent of established cardiovascular disease risk factors. When stratified by sex, results remained consistent across outcomes when comparing high to low ML-AAC24; with the exception of weak HGS in females.

Conclusion: ML-AAC24 severity was associated with poorer muscle composition and strength, as well as sarcopenia. These cross-sectional findings suggest that vascular disease has deleterious effects on muscle health. However, results need to be confirmed using longitudinal studies.



Odds ratio (95%CI)

Multivariable-adjusted logistic regression analysis for the cross-sectional association between ML-AAC24 extent and odds of having poorer muscle health measures. Proportion of individuals in low (reference), moderate and high ML-AAC24 was ~79%, 16% and 5%, respectively. Model adjusted for age, BMI, physical activity, smoking status, ethnicity, prevalent diabetes and atherosclerotic cardiovascular disease, geographic region in the UK, deprivation index and imaging year. Fat free muscle volume (FFMV) and muscle fat infiltration (MFI); hand grip strength (HGS); EWGSOP2-defined sarcopenia. Low FFMV adopted age- and sex-specific cut-points; i) 45-59 years: male <9.61 L, female <6.21 L; ii) 60+ years: male <9.01, female <5.93 L. High MFI was based on >75th percentile for male (>7.64%) and female (>8.75%).

1. Dalla Via et al. 2023 JBMR

OC38

ROMOSOZUMAB AND DENOSUMAB COMBINATION THERAPY IN POSTMENOPAUSAL OSTEOPOROSIS

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Background

Transitioning from long-term denosumab to PTH-analogs or romosozumab may expose patients to a rebound phenomenon. Adding romosozumab to denosumab may offer a therapeutic alternative for postmenopausal women who sustain fractures while on denosumab.

Objectives

This study aimed to evaluate the effects of combining romosozumab with ongoing denosumab therapy in postmenopausal osteoporosis.

Methods

We conducted a combined 12-month prospective and 24-month retrospective observational study. Postmenopausal women were divided into three cohorts:

1. Treatment-naive patients initiating romosozumab (Naïve→Romo; M-24 to M+12),
2. Patients on denosumab who added romosozumab (Dmab→Dmab+Romo; M-24 to M+12),
3. Patients continuing denosumab (Dmab→Dmab; M-24 to M+12).

Bone mineral density (BMD) and bone turnover markers (BTMs; CTX and P1NP) were measured at key time points. A mixed model for repeated measures (MMRM) was used to assess percentage and absolute changes in BMD and BTMs, with treatment sequence, time, treatment-by-time interaction, and baseline BMD as fixed effects and patients as random effects.

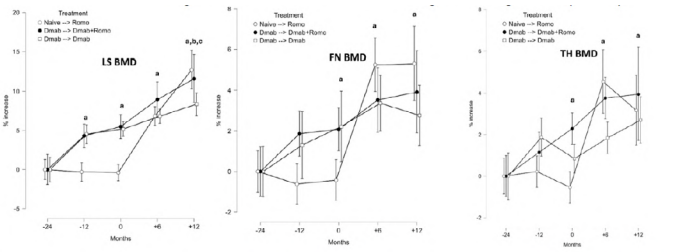
Results

A total of 139 patients participated: 90 were Naïve→Romo, 25 were Dmab→Dmab+Romo, and 24 were Dmab→Dmab. At lumbar spine M+12, the Dmab→Dmab+Romo group showed a trend toward greater BMD increases compared to the Dmab→Dmab group (+3.2%, SE 4.4; p = 0.074), as did the Naïve→Romo group compared to Dmab→Dmab (+4.4%, SE 3.7; p = 0.064). No significant differences were observed at the femoral neck or total hip. P1NP levels significantly differed at M+3 between the Dmab→Dmab and Dmab→Dmab+Romo groups (+24.4 ng/mL,

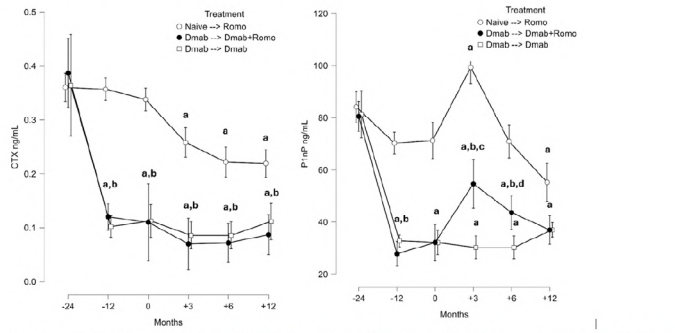
SE 12.6; p = 0.033), with a trend toward significance at M+6 (+13.4 ng/mL, SE 7.7; p = 0.057).

Conclusion

Romosozumab retains anabolic potential when combined with denosumab, supporting its use in patients with severe osteoporosis inadequately responding to long-term denosumab.



a, p value <0.05 vs baseline; b, p value 0.074 for Dmab →Dmab vs Dmab →Dmab+Romo; c, p value 0.064 for Dmab →Dmab vs Naive →Romo. Between-groups differences were tested with a mixed model for repeated measures (MMRM) using Satterthwaite and restricted maximum likelihood method with treatment sequence, time, treatment-by-time interaction, and baseline bone mineral density (BMD) as fixed effects and with patients as random effect. LS, lumbar spine; FN, femoral neck; TH, total hip



a, p value <0.05 vs baseline; b, p value <0.05 for Dmab →Dmab and Dmab →Dmab+Romo vs Naïve →Romo; c, p value 0.033 for Dmab →Dmab vs Dmab →Dmab+Romo; d, p 0.057 for Dmab →Dmab vs Dmab →Dmab+Romo. Between-groups differences were tested with a mixed model for repeated measures (MMRM) using Satterthwaite and restricted maximum likelihood method with treatment sequence, time, treatment-by-time interaction, and baseline bone mineral density (BMD) as fixed effects and with patients as random effect. CTX, C-terminal telopeptide of type I collagen; P1NP, Procollagen I Intact N-Terminal Peptide

OC39

FIVE-YEARS OF CALCIUM SUPPLEMENTATION IS NOT ASSOCIATED WITH LONG-TERM RISK OF DEMENTIA IN OLDER WOMEN: POST-HOC ANALYSIS FROM A RANDOMISED CLINICAL TRIAL

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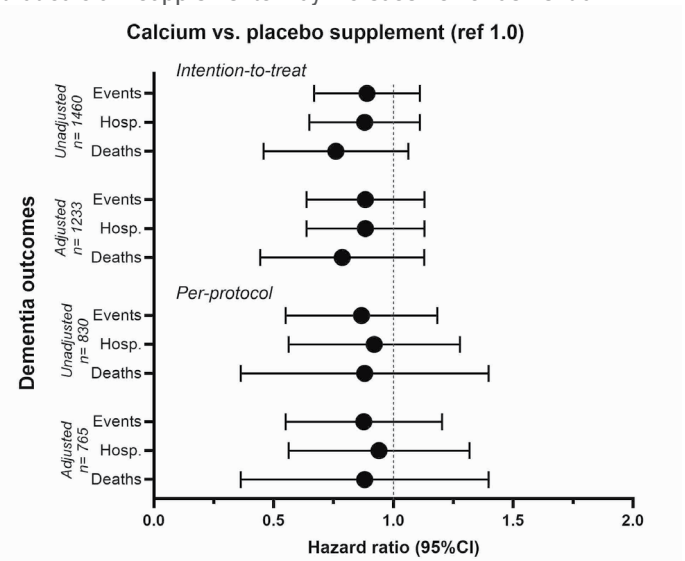
Objective: Calcium supplementation is a common strategy adopted to prevent bone loss, especially in older women. However, concerns have been raised around whether these supplements may increase dementia risk. To date, data investigating these concerns are limited. This post-hoc analysis of a 5-year double-blind, placebo-controlled randomised trial of calcium supplements evaluated the long-term risk for dementia in older women randomised to either calcium supplements or placebo.

Methods: 1460 community-dwelling Australian women aged 70 years and over, without cognitive impairment, took part in the Calcium Intake Fracture Outcome Study (CAIFOS) in 1998. Women received either 1200 mg of calcium carbonate per day (n=730) or an identical placebo (n=730) for 5 years. The effects of calcium supplementation on dementia outcomes were examined using unadjusted and multivariable-adjusted Cox regression analysis under both intention-to-treat (ITT) and per-protocol criteria (PP, ≥80% tablet compliance). Dementia outcomes were obtained from linked hospital and mortality records from baseline over the next 14.5 years.

Results: Mean age of women at baseline was 75.2 ± 2.7 years. Over 14.5 years, 269 women (18.4%) suffered a dementia event, comprising of dementia-related hospitalisations (n=243, 16.6%) and dementia-related deaths (n=114, 7.8%). Compared to placebo, calcium supplements were not associated with increased hazards for any of the dementia outcomes in unadjusted and multivariable-adjusted ITT and PP analysis (Fig). No significant differences in the cumulative dementia-free survival rates were observed between women randomised to calcium supplements or placebo for any dementia outcome (log-rank test, all p>0.05).

Conclusion: There was no association between randomisation of 1200 mg per day of calcium supplements over 5 years with long-term risk for dementia. These findings do not support concerns that calcium supplements may increase risk of dementia.



Hazard ratios (95%CI) for dementia events, hospitalisations and deaths for women provided calcium supplements (●), compared to placebo. Adjusted model included age, BMI, apolipoprotein E, prevalent diabetes and atherosclerotic cardiovascular disease, statin and aspirin use, physical activity, smoking status, dietary calcium and alcohol intake and socioeconomic status. Only women with complete data for all covariates were considered in adjusted analysis.

OC40

THE EFFECT OF DENOSUMAB ON FUNCTIONAL RECOVERY IN OLDER PATIENTS UNDERGOING SURGICAL FIXATION FOR INTERTROCHANTERIC FEMORAL FRACTURE: A RANDOMIZED, PLACEBO-CONTROLLED TRIAL

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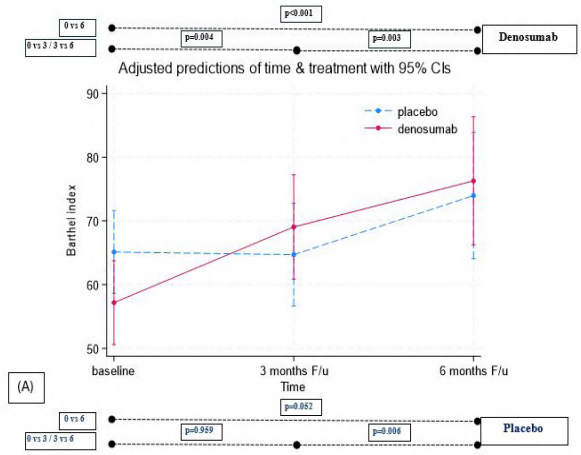
[1]Mahidol University, Bangkok, Thailand

Objective:
This study aimed to compare the effects of denosumab (Dmab) versus placebo on postoperative functional recovery at 6 months in older adults undergoing surgical fixation for intertrochanteric fractures.
Material and Methods:
In this double-blind, randomized, placebo-controlled trial, 85 older adults with isolated intertrochanteric fractures who underwent surgical fixation were enrolled. Participants were randomized to receive either Dmab or placebo within 2 weeks postoperatively. All patients received calcium and vitamin D supplementation. The primary outcome was functional recovery, assessed using changes in the Barthel Index (BI) from baseline to 3 and 6 months post-surgery. The secondary outcomes included the modified Harris Hip Score (mHHS), the Numerical Pain Rating Scale (NPRS), the Timed Up and Go test (TUG), and fracture healing evaluated by the Radiographic Union Score for Hip (RUSH).
Results:
The mean age of participants was 82.7 years, and 70 patients completed the 6-months follow-up. Patients receiving Dmab showed significantly greater BI improvement at 3 and 6 months compared with baseline, while those in the placebo group demonstrated significant BI improvement only between 3 and 6 months. Linear mixed-effects model confirmed a significantly higher mean change in BI in the Dmab group compared to placebo (11.2 vs 0.2, respectively; p = 0.043). No significant differences were observed between the two groups regarding mHHS, NPRS, or TUG at any time points. Similarly, fracture healing did not differ significantly between the Dmab and placebo groups, with comparable RUSH scores at both 3 and 6 months.
Conclusion:
Administering Dmab within 2 weeks after surgical fixation of an intertrochanteric fracture significantly enhanced short-term functional recovery, without negatively affecting fracture healing or union time. Therefore, Dmab is a safe and effective antiosteoporosis agent for improving postoperative functional outcomes and reducing future fracture risk in this patient population.



Barthel index	Denosumab		Placebo		Difference (95%CI)	Between group p-value[b]
	Mean change (95%CI)	Within group p-value[a]	Mean change (95%CI)	Within group p-value[a]		
3 months - baseline	11.2 (3.5, 18.9)	0.004	0.2 (-7.2, 7.6)	0.959	-11.0 (-21.7, -0.4)	0.043
6 months - baseline	20.6 (11.4, 29.8)	<0.001	9.0 (-0.1, 18.1)	0.052	-11.6 (-24.6, 1.3)	0.078
6 months - 3 months	9.3 (3.1, 15.4)	0.003	8.7 (2.5, 14.8)	0.006	-0.6 (-9.3, 8.2)	0.898

Figure (A) Barthel Index scores at baseline, 3-months and 6-months after surgical fixation for an intertrochanteric femoral fracture and (B) Comparing mean change of Barthel Index scores between Dmab and placebo groups by using linear mixed-effects model

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PL1

HORMONE THERAPY FOR FRACTURE PREVENTION – A SEX STRATIFIED APPROACH

M. McClung[1]

[1]Oregon Osteoporosis Center, Portland, OR, United States

Sex steroids play important roles in determining peak bone mass and in bone loss after menopause and with ageing. Adults with sex steroid deficiency experience bone loss and increased fracture risk. These observations justify the consideration of using of sex steroids to reduce fracture risk in patients with sex steroid deficiency.

Testosterone therapy increases bone mineral density (BMD) and bone strength in men with low serum testosterone level. In 4804 hypogonadal men randomly assigned to testosterone or placebo, followed for an average of 3.19 years, fracture rates were unexpectedly higher (3.50%) with testosterone vs placebo (2.46%); hazard ratio 1.43 (1.04–1.97). These results suggest that testosterone should not be prescribed to protect hypogonadal men from fracture.

Estrogen therapy in postmenopausal women prevents bone loss and significantly reduces fracture risk. In the Women's Health Initiative studies, menopausal hormone therapy significantly reduced rates of vertebral, hip and all clinical fractures in generally healthy postmenopausal women whose average age was 63 years. Because registration trials with estrogen have not been conducted in patients with postmenopausal osteoporosis, it is not approved as an osteoporosis treatment but is approved for preventing postmenopausal osteoporosis in some countries including the United States Specifics about the long-term safety of estrogen therapy are complex. The risk:benefit profile of estrogen is positive when treatment is begun near the time of menopause, especially in those with low BMD at high risk of developing osteoporosis. Guidance for the appropriate use of estrogen for the prevention of osteoporosis and fractures should be included in the next iterations of clinical guidelines.

In contrast to the skeletal effectives of estrogen in postmenopausal women, evidence for a salutary effect of testosterone therapy to reduce fracture risk in men is lacking.

PL2

ANTI-RESORPTIVES AND BONE FORMING THERAPIES: IN SERIES (SEQUENTIAL) OR IN PARALLEL (COMBINATION)?

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As with many other chronic, progressive non-communicable diseases, the effective treatment of osteoporosis and prevention of fractures remains an unmet need in many healthcare systems. The range of age-dependent fracture risk is wide and the need for long-term therapy essential. The latter is true whether strategies to reduce fracture burden are public health/population-based approaches or are adapted to address the individual patient. While a wide range of effective medications is available, the optimal strategy within any single complex clinical circumstance is often not addressed by randomised clinical trials due to cost and logistic restrictions; thus studies on treatment sequence or combinations tend to be limited in number, size and clinically relevant endpoints.

Within the clinical setting, the choice between the two main classes of osteoporosis medication (anti-resorptive and bone-forming/anabolic treatments) and whether these should be used in sequence (series) or in combination (parallel) will depend on patient-specific factors such as fracture risk, bone density, bone turnover and anticipated response to therapy. In those at moderate to high fracture risk, sequential therapy is a frequent choice as it is assumed to meet the needs of most patients; however, the increasing awareness that prior treatment with a particular class of medications can blunt the subsequent response to another class if needed has started to inform more debate about the actual order of the sequence. There is an increasing movement towards starting with anabolic agents (with the aim of building new bone) followed by anti-resorptive therapy (to maintain the bone mass attained and prevent further loss); this approach is certainly mandated in many guidelines in patients deemed to be at very high fracture risk. In the latter category, those at high imminent fracture risk in particular, for example following a recent vertebral or hip fracture, need the fastest possible gain in bone density something that can be delivered more readily by anabolic therapies. But is there also a role for combination or parallel treatment in this setting: Several studies have demonstrated that not all combinations have been shown to be more effective than sequential therapy, and increased costs and side effects need to be considered. This lecture will review the evidence base for sequential and combination approaches to management of osteoporosis.

PL3

OSTEOANABOLICS: TO LUMP OR TO SPLIT?

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During the last years, the paradigm of the treatment of osteoporosis has significantly changed, following the publication by ESCEO and IOF of an algorithm for the management of patients at risk of fractures. Now, the classical "one-size fits all" treatment approach is obsolete. Patients should be treated on the basis of their fracture risk. Patients at imminent (very high) risk for fracture should receive, as first-line, background treatment, a bone forming agent (BFA) followed by the prescription of an anti-resorptive agent. Three BFA are currently marketed, two PTH Receptor 1 Agonists and an anti-sclerostin

antibody. PTH RA include Teriparatide and Abaloparatide while Romosozumab is the anti-sclerostin antibody. All of them have shown to significantly reduce fracture rates at all skeletal sites including spine, non-spine, major osteoporotic fractures and hip. They provide a greater anti-efficacy compared to anti-resorptive agents. All of them present a reasonable risk/benefit ratio with only minor concerns for the prescription of Romosozumab in patients with a previous history of cardiovascular disorders. After a BFA is stopped, an anti-resorptive agent should be prescribed to maintained the benefit obtained during treatment. When BFA are prescribed after the prolonged administration of a potent anti-resorptive agent, their beneficial effect on cortical bone is partially mitigated which suggests that an anti-resorptive agent could be prescribed during the first months of administration of the BFA. Sequential treatment associating a BFA and an anti-resorptive agent was shown to be cost-effective compared to an anti-resorptive agent alone and compared to no treatment. The benefit of BFA is particularly evident (clinically and economically) in patients at higher risk for fracture.

PL4

OBESITY STRATIFICATION IN PERSONALISED OSTEOPOROSIS MANAGEMENT

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Obesity is accompanied by a higher bone mineral density (BMD), compared with non-obese age-matched peers. Low BMD affects only a minority of candidates for bariatric surgery with Class 3 obesity. While obesity defined by body mass index (BMI) is also generally associated with a lower fracture incidence despite higher BMD, fractures of the ankle, lower leg and humerus are more common in obesity. BMI is a better indicator of lean than fat mass, thus, higher lean mass, not fat mass, likely explains positive associations between higher BMI and BMD in older adults. Body fat distribution may be more predictive of osteoporotic fractures than BMI. Men with higher visceral adipose tissue levels have poorer bone mechanical properties, despite having similar BMD compared with those with low visceral adipose tissue. High waist circumference was also associated with an increased risk of hip fracture. Metabolic and endocrine factors associated with fractures in obesity include adipokines, type 2 diabetes, lower vitamin D levels, lower testosterone levels in men, and a higher falls risk. Fracture risk is highest in sarcopenic obesity where visceral fat and intra- and inter-muscular adipose tissue have adverse effects on bone health resulting in an increase in nonvertebral fractures.

Intestinal calcium absorption decreases, while bone loss (8% at the hip over 12 months), bone remodelling, and fractures all increase following both gastric bypass and restrictive bariatric surgery; fracture risk is greater following malabsorptive surgery. Guidelines recommend treating vitamin D deficiency with daily doses of >2,000 IU oral colecalciferol, adequate daily calcium and protein intakes, and promoting physical exercise before and following bariatric surgery. Parenteral antiresorptive therapy is reserved for those patients who have low BMD (T-score <-2), prior fragility fractures or high fracture risk. About 25% of bariatric surgery patients may develop mild hypocalcemia following antiresorptive therapy despite adequate calcium and vitamin D. Bariatric medicine causes similar reductions in body weight to bariatric surgery. Despite similar weight loss, liraglutide treatment reduced hip and spine BMD compared with exercise alone. Resistance exercise minimizes loss of lean mass and total hip BMD associated with glucagon-like peptide-1 (GLP-1) agonist treatment. A similar approach to maintaining bone health therefore seems sensible for patients initiating treatment with GLP-1 agonist treatment.

PL5

ADVANCES IN PERSONALIZED FRACTURE RISK ASSESSMENT: FRAX AND BEYOND

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We now have an enviable range of medications to improve bone mineral density across both antiresorptive and now anabolic mechanisms. Recent head-to-head studies have demonstrated superiority of teriparatide and romosozumab, compared with oral antiresorptives, both in terms of rapidity of onset and magnitude of effect. Until recently, guidelines for the management of osteoporosis have focused on the question of treatment versus no treatment. However, such findings have fuelled moves internationally, initially from ESCEO, supported by IOF, to promote a stratified approach to treatment, with choice of medication personalised according to baseline fracture risk. Different organisations espouse different definitions of very high fracture risk in this stratified approach, with the IOF-ESCEO favouring an absolute fracture probability threshold based on the European Guidelines using FRAX®. This stratified approach, predicated on baseline fracture risk, enables the most effective treatments, anabolic agents, to be targeted to those at very highest fracture risk. New understanding of genetic instruments for bone mineral density, and artificial intelligence approaches to risk assessment in big datasets, have suggested methods to, in years to come, stratify individuals at the level of healthcare systems. In future systems linking together such assessments, it may be possible to initially identify those likely to be at high fracture risk on the basis of information held in a medical records database. These patients could then be invited for subsequent clinical assessment and treatment, using FRAX and measurement of bone mineral density. In this presentation, I will review ways in which medication choices may be stratified according to individual characteristics and other considerations, and how these approaches might be integrated into novel clinical pathways.

PL6

MICRORNAS: NOVEL RISK PREDICTORS IN MUSCULOSKELETAL DISEASE?

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Over the past 3 decades a wide array of regulatory non-coding RNAs have emerged as crucial factors for gene regulation in most tissues. MicroRNAs (miRNAs) are a class of are highly conserved, small non-coding RNAs (generally consisting of 18-25 nucleotides) that play a crucial role in the regulation of messenger RNA expression, stability and translation, thereby modulating numerous cellular pathways, with likely implications for the pathogenesis of numerous common diseases, including musculoskeletal disorders. A rising number of experimental reports suggest that miRNAs contribute to every step of osteogenesis and bone homeostasis, from embryonic skeletal development to maintenance of adult bone tissue, by regulating the growth, differentiation, and activity of different cell systems inside and outside the skeleton. Likewise, emerging information from animal studies indicates that targeting miRNAs might become an attractive and new therapeutic approach for musculoskeletal diseases, even though there are still major concerns related to potential off target effects and the need for efficient delivery methods *in vivo*. Moreover, besides their recognized effects at the cellular level, evidence is also gathering that miRNAs are excreted and can circulate in blood or other body fluids with potential paracrine or endocrine functions. Thus, they could represent suitable candidates for becoming sensitive biomarkers in different pathologic conditions, including musculoskeletal disorders. Available evidence provided some indications about potential miRNA signatures associated with osteoporosis, fracture risk or other bone disorders (i.e. primary hyperparathyroidism) as well as with sarcopenia. However, results remain conflicting, in part due to differences in patient selection, type of samples, or analytical methods, so that no definitive conclusion can be reached at this stage. Further replication in prospective studies of larger population-based samples is therefore necessary to define more reliable miRNA signatures to be used in the clinical practice for diagnostic, preventive and therapeutic purposes.

PL7

NOVEL CONCEPTS: ASSESSMENT OF INTRINSIC CAPACITY

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The world population is aging but there is a substantial gap between total longevity and healthy longevity. 'Intrinsic capacity' is the term used by the World Health Organization (WHO) to describe *"The composite of all of the physical and mental capacities that an individual can draw on for healthy longevity"*. To expand healthy longevity, the WHO has initiated a model program entitled "Integrated Care for Older People (ICOPE)". ICOPE involves monitoring and support for older adults in six domains: mobility, nutrition, vision, hearing, cognitive function, and mental health. Implementation of ICOPE includes screening, assessment, personalized interventions, and follow-up monitoring in the six domains. A large-scale study in France has demonstrated the feasibility of enrolling older adults in the ICOPE program (*Tavassoli N. Lancet Healthy Longevity 2022*). Between January, 2020 and November 2021, 10,903 older adults, mean age 76 years, were screened, and, of these, 7,367 were eligible for the program (that is, would potentially benefit in one or more of the six domains). Of those who were eligible, 70.4% had had their 6-month follow-up at the time of the first report, indicating that retention was higher than expected. The ICOPE implementation in the French study involves use of remote monitoring and digital data collection and tracking in combination with educating and involving primary care and other health care workers. The different steps in the ICOPE program will be reviewed during the presentation. Subsequent reports are expected to provide information on the impact of the program on the intrinsic capacity of ICOPE participants.

Other organizations are espousing the Healthy Longevity concept. For example, the National Academy of Medicine launched 'The Healthy Longevity Global Grand Challenge', a worldwide initiative to improve physical, mental, and social well-being for people as they age. The X-Prize competition has chosen 'Healthy Longevity' as its current theme. The healthy longevity movement not only aims to improve the lives of older adults, it addresses the reality that birth rates are declining and life expectancy is increasing, and increased productivity made possible by extending the healthy lifespan is needed to make all lives better.

PL8

OSTEOIMMUNOLOGY: A LEGACY DISCIPLINE?

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Bone mass and bone strength are strongly dependant on age, gender and hormones, but in recent years the negative effects of inflammatory cytokines (such as TNFα and IL-6) on bone, the so-called osteoimmunology, has been unraveled.

Clinically, this has been reflected by an increased fracture rate in individuals with low grade systematic inflammation, based on CRP-levels[1]. In patients with systematic inflammatory diseases, such as in rheumatic diseases and inflammatory bowel diseases, BMD is often lower and fracture rate higher than in healthy controls of the same age.

The negative effects of systemic inflammation is probably best studied in patients with rheumatoid arthritis (RA): both a low BMD in the osteoporotic range and vertebral- and nonvertebral fracture occurred roughly twice as much. Localized bone loss around the joints (bone erosions) are characteristic of RA.

Since both the generalized bone loss and the local bone loss are strongly related to inflammation, it could be expected that with effective anti-inflammatory drugs, the bone loss could be

prevented. We were among the first to demonstrate that with the TNFα blocker infliximab the usually occurring bone loss in RA could be prevented[2]. The same was later observed for another TNFblocker, adalimumab, and B-cell blockade, IL-6 blockade and JAK-inhibition.
We also showed in the BEST-trial with a treat to target design that local bone erosions could be prevented in more than 80% of patients during 10 years of treatment.[3]
Strikingly, very recent data with HRpQCT imaging have shown some repair of erosions in RA during treatment with baricitinib[4].
Thus, there are a lot of studies showing that with effective antirheumatic drugs, which are currently available in RA, both local and generalized bone loss can be minimized.[5] With the broad armamentarium of antirheumatic drugs it must be possible nowadays to have many RA-patients in clinical remission, with absence or only mild arthritic symptoms, and strong limitation of the negative effects on bone over time

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PL9

WHEN SHOULD WE CONSIDER MOVING FROM MEDICAL TO SURGICAL MANAGEMENT IN OA OF THE KNEE & HIP?

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The surgical intervention with best outcomes for osteoarthritis (OA) is total joint replacement (TJR). Pain remains the main indication, though its persistence over time may be more important to patients than intensity at a single time point. Stiffness, sometimes indistinguishable from pain, and functional impairment are other drivers. The decision for surgery is also based on radiographic severity, general health, willingness to undergo operation, surgeon decision, financial considerations and patient expectations. The latter may be changing with patients considering joint replacement at an earlier age, driven by increasing obesity and sedentary lifestyles, being unwilling to accept sustained symptoms, and a desire to return to sport. A range of appropriateness tools have been developed though there has been varied uptake.
Before transitioning a patient to TJR, clinicians need to ensure adequate conventional therapy has been trialled for a given patient. The range of available therapies is sadly limited, but weight loss when relevant, muscle strengthening or physical therapy, and appropriate use of analgesics are standard therapies recommended in all OA guidelines. In hip OA, there are fewer therapeutic options, and given the better long-term outcomes (compared to knee TJR), hip replacement may be a more straightforward decision.
Can we optimise pre-operative care for knee TJR? A recent feasibility study provided a package of care for patients awaiting TKR and focussed on weight loss (using strict dietary replacements), analgesia and orthotics reviews and a package of quadriceps strengthening exercise. Of 60 people randomised, use of the various components varied and adherence was high. Significant improvement in quality of life was observed and 10% of patients cancelled their surgery. The advent of highly effective weight loss drugs, recently showing excellent benefits for OA pain and function, may change demand for surgery in this group.

PL10

SUCCESSFUL FRACTURE HEALING: DO OSTEOPOROSIS AND ITS TREATMENT MATTER?

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Fracture healing is a multistep process. Most fractures heal through a combination of intramembranous and endochondral ossification. Radiographic imaging is important for evaluating fracture healing and for detecting delayed union or non-union. The presence of callus formation, bridging trabeculae, and a decrease in the size of the fracture line over time are indicative of healing. Imaging must be combined with clinical parameters and patient reported outcomes. Animal data support a negative effect of osteoporosis on fracture healing, however clinical data shows conflicting results. Evidence does not support a delay in the initiation of antiresorptive therapy following acute fragility fractures. There is no reason for suspension of osteoporosis medication at the time of fracture if the person is already on treatment. Teriparatide treatment may shorten fracture healing time at certain sites such as distal radius, however, it does not prevent non-union or influence union rate. A beneficial effect of Romosozumab on fracture healing has not been demonstrated in clinical studies so far. Pre- or post-operative bisphosphonate use also does not negatively affect union in those undergoing spinal fusion surgery. Denosumab appears to improve pedicle screw fixation in spinal fusion surgery as does teriparatide. Overall, there appears to be no deleterious effect of osteoporosis medications on fracture healing or on union rates in spinal fusion surgeries. The benefit of treating osteoporosis and the urgent necessity to mitigate imminent refracture risk after a fracture should be given prime consideration. It is imperative that new radiological and biological markers of fracture healing be identified. It is also important to synthesize clinical and basic science methodologies to assess fracture healing, so that a convergence of the two frameworks can be achieved.

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Educational Lectures Abstracts

EL1

LESSONS FROM INTERVENTIONAL STUDIES CONDUCTED IN SARCOPENIA: ARE WE CLOSE TO A TREATMENT

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Sarcopenia, the age-related loss of muscle mass and function, is a major contributor to frailty, disability, and reduced quality of life in older adults. Over the past decade, numerous interventional studies have aimed to address the underlying mechanisms and explore potential treatments for sarcopenia. These studies have provided valuable insights into the roles of exercise, nutritional supplementation, and pharmacological agents in mitigating muscle loss and improving muscle strength and performance.
Exercise interventions, particularly resistance training, remain the cornerstone of sarcopenia management, with evidence demonstrating significant improvements in muscle mass and physical function. Nutritional strategies, such as protein supplementation and the use of specific nutrients like vitamin D and omega-3 fatty acids, have shown promise, particularly when combined with exercise. Recent pharmacological trials targeting anabolic pathways, myostatin inhibition, and inflammation modulation have yielded mixed results, highlighting both the potential and challenges of drug development for sarcopenia.
Despite these advances, the translation of findings into effective and widely applicable treatments remains a challenge due to heterogeneity in study populations, variability in intervention protocols, and limitations in clinical outcome measures. This presentation will summarize key lessons from interventional studies conducted in sarcopenia, discuss the progress made toward identifying effective treatments, and outline the gaps that need to be addressed to move closer to a standardized, evidence-based therapeutic approach for this condition.
Keywords: Sarcopenia, interventional studies, exercise, nutrition, pharmacological treatment, muscle health.

EL2

OSTEOPOROSIS IN INFLAMMATORY RHEUMATIC MUSCULOSKELETAL DISEASES (IRMDS)

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Osteoporosis is a common yet often underdiagnosed complication in patients with inflammatory rheumatic musculoskeletal diseases (iRMDs). Chronic inflammation, prolonged glucocorticoid use, and reduced physical activity synergistically contribute to bone fragility, increasing fracture risk. This lecture will explore the complex interplay between inflammation and fracture risk, emphasizing recent advances in understanding and managing osteoporosis in the context of iRMDs.
Systemic inflammation in conditions such as rheumatoid arthritis (RA), spondyloarthritis (SpA), and systemic lupus erythematosus (SLE) disrupts bone homeostasis by favoring osteoclastogenesis and inhibiting osteoblast function. Key cytokines, including TNF-α, IL-6, and IL-17, directly promote bone resorption, while glucocorticoids, frequently prescribed to manage disease activity, exacerbate bone loss by suppressing bone formation. Consequently, patients with iRMDs exhibit higher rates of vertebral and non-vertebral fractures, even at a younger age compared to the general population.
Clinical management requires a multifaceted approach integrating inflammation control, bone-directed therapies, and lifestyle interventions. Emerging evidence highlights the role of biologics targeting TNF, IL-6, and IL-17 in mitigating bone loss, potentially offering dual benefits of disease control and fracture prevention. However, other targeted therapies (like JAKi) yielded controversial results, with some even apparently increasing the risk of fracture.
The lecture will discuss data from recent trials and observational studies demonstrating the impact of biologics on bone mineral density (BMD) and bone turnover markers. Additionally, the role of anti osteoporotic agents such as romosozumab and denosumab in patients with severe osteoporosis will be considered, with a focus on sequential and combination strategies to optimize bone health.
This lecture aims to provide clinicians with updated insights and practical tools to bridge the gap between inflammation control and bone protection.

EL3

BIOSIMILARS IN OSTEOPOROSIS MANAGEMENT

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Objective: Understand the potential role of biosimilars in osteoporosis management
Discussion: A biosimilar is a biological medicine highly similar to another biologic medicine already approved (the so-called reference medicine). Because biosimilars are made in living organisms there may be some minor differences from the reference medicine which are not clinically meaningful. Biosimilarity means high similarity in terms of structure, biologic activity in efficacy, safety and immunogenicity profile.
Evidence acquired over 10 years of clinical experience has shown that biosimilars can be used safely and effectively in all their approved indications as other biologic medicines. By demonstrating biosimilarity, a biosimilar can rely on the safety and efficacy experience gained with reference medicine.
There are now multiple biosimilars in osteoporosis management for teriparatide and denosumab. The availability of biosimilars for osteoporosis management will significantly reduce the costs of medications for osteoporosis for both reference products and biosimilars and improve their availability to patients. Biosimilars to denosumab are cost effective in comparison to bisphosphonates which may influence their role in osteoporosis guidelines.

Interchangeability refers to the possibility of exchanging one medicine for another with the same clinical effect which can be done by either switching or substitution. Biosimilar interchangeability is regulated differently in the US and EU.
Healthcare professionals have a central role in educating patients and avoiding the nocebo effect. Providers are increasingly familiar and comfortable with prescribing biosimilars ; however there remains work to be done. Patient understanding of biosimilar products will be key to the utilization of these drugs. Patients want to hear first from their healthcare providers. Having the provider introduce the subject of biosimilars is a key part of the conversation with patients.
Conclusion: Biosimilars will play an important role in future osteoporosis management
Disclosures: scientific advisor Sandoz, consultant Celltrion

EL4

PREGNANCY - AND LACTATION-RELATED OSTEOPOROSIS

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Pregnancy and lactation-associated osteoporosis (PLO) is a rare condition characterized by fragility fractures occurring during late pregnancy or lactation, primarily affecting the spine and causing significant morbidity and back pain. PLO can lead to mobility impairment and work incapacity, with recovery taking up to several years.
Early diagnosis of pregnancy- and lactation-associated osteoporosis (PLO) is mandatory for a good outcome.
Standard care is not a matter of conventional guidelines and protocols, rather of a single case-by-case strategy. Immobilization due to multiple VFs, hip/femoral neck fractures, the use of orthopedic braces, and major surgical procedures (such as vertebroplasty or hip replacement) is part of the specific orthopedic approach. The decision to perform emergency cesarean in PAO is sometimes required based on complex and challenging multidisciplinary considerations. PLO requires stopping breastfeeding in order to resume the hypo-estrogenic and hyper-prolactinemic status and milk-associated calcium loss and potentially to reduce the levels of PTHrP. Calcium and VD supplements represent the accepted consensus regarding medication against PLO. Specific drugs against osteoporosis such as bisphosphonates, denosumab, teriparatide, and, romosozumab are selectively offered to patients after delivery up to a maximum of 5 years, depending on case.
The presentation will emphasize PLO severity, advocating for increased awareness and timely interventions. TPD emerges as a promising therapeutic option in certain cases.

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ESCEO Symposia Abstracts

ESCEO1

WHICH PATIENTS SHOULD BENEFIT FROM A BONE-FORMING AGENT

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Anabolic, or bone-forming therapies (namely teriparatide, abaloparatide and romosozumab), are crucial in the management of osteoporosis in patients at very high risk of fractures. In this patient group, the benefits of the most potent anabolic therapies have been demonstrated in a range of studies across the world. However in real-world clinical practice only a limited proportion of these high risk patients are appropriately identified and treated. The definition of very high fracture risk and recommendations for management of these patients differs between countries, as does the availability of bone-forming agents.

In this session, we will discuss the evidence for the use of bone forming-agents in patients at high or very high risk of fractures, and how these patients are best identified. We will consider the positioning of bone-forming agents within the long-term treatment strategy for osteoporosis. The barriers to the use of bone forming agents (and potential facilitators), from the patient and health economic perspective, will also be discussed.

ESCEO2

COMPARATIVE EFFICACY AND SAFETY OF CURRENTLY AVAILABLE BONE FORMING AGENTS

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Anti-osteoporosis treatments display short-term high magnitude antifracture efficacy and long-term favorable safety profile. Head-to-head studies demonstrate greater rapidity of action and higher effect magnitude of anabolic compared with antiresorptive therapies in fracture risk reduction. In patients at very high or imminent fracture risk, the use of an anabolic agent as the initial treatment, followed by maintenance of the benefits with antiresorptive agent, offers a more effective strategy than first-line antiresorptive therapy for fracture risk reduction in these very vulnerable patients. Except some well recognized increase in heart rate and decrease in blood pressure, PTH-receptor 1 agonists like teriparatide or abaloparatide are not associated with higher risk of cardiac adverse event nor of bone cancer. The possible cardiovascular signal of romosozumab in patients with history of cardiac disorders or stroke should be verified in post-market surveillance. These sequential treatment regimens in very high risk patients are cost-effective. With the limitation of country specific drug registration and reimbursement policy, these regimens should become the standard of care for patients at very high or at imminent risk of fracture, considering their efficacy and safety.

ESCEO3

RELATION BETWEEN COGNITIVE IMPAIRMENT AND BONE HEALTH

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Objective

To discuss the multimodal relation between cognitive impairment and bone health.

Material and methods

A systematic search for publications of studies with terms “bone health”, “sarcopenia”, “cognitive impairment” and “dementia” was performed. Sixteen studies were identified where a screening tool for cognition was used, from 2007 onwards. Discussion on mechanisms of disease encompass both clinical and preclinical data.

Results

Cognition may relate to bone health and sarcopenia both through direct and indirect pathway. Direct: when the pathologic mechanism causing cognitive impairment also affects bone health. This includes mechanisms such as: a) inflammatory [Amyloid precursor protein (APP) and A β-amyloid are increased in both neurons, osteoblasts (impairing function and proliferation) and osteoclasts (promoting activity); Wnt/β-catenin promote synaptic health in the brain and osteoblast differentiation and increased bone mass; TREM2, protects microglia in the brain and controls the rate of osteoclastogenesis]; b) oxidative stress; and the well-known c) Oestrogen and Vitamin D deficiencies, all of which are shared between frail / sarcopenic and cognitively impaired patients. Indirect: where changes in cognition, behaviour or disease treatment ultimately induce worsening bone health. This includes a) diet restrictions; b) decreased mobility; c) decreased sun exposure; d) drug mediated increase of inattention and falls; e) Aggressive / risky behaviour / caregiver wellbeing; f) Loss of compliance (pharmacological and non-pharmacological interventions and diet).

Conclusion

There is cumulative evidence that cognitive impairment is closely linked to worsening of bone health via direct and indirect pathways. With the world population growing older and more cognitively impaired, there is need to understand better the relation with bone health and cognition. Knowledge of this relation will allow the development of measures to prevent and treat bone health and sarcopenia loss.

The Author has nothing to disclose.

ESCEO4

DRUGS USED IN COGNITIVE IMPAIRMENT AND BONE HEALTH

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Alzheimer's disease (AD) is the leading cause of cognitive impairment and dementia in subjects above 65 years of age. AD currently affects approximately 50 million people worldwide, and is the sixth-leading cause of death in the United States. Pathophysiological changes in the brains of affected individuals develop years before any clinical manifestations are observed.
Symptomatic treatments for AD dementia include cholinesterase inhibitors (donepezil, rivastigmine, galantamine) and N-methyl-D-aspartate antagonists (memantine).
Recently, disease modifying medicinal product lecanemab was approved in the EU for the treatment of adult patients with a clinical diagnosis of mild cognitive impairment and mild dementia due to Alzheimer's disease (Early Alzheimer's disease) who are apolipoprotein E ε4 (ApoE ε4) non-carriers or heterozygotes with confirmed amyloid pathology. Donanemab is currently under assessment at the EMA. In the US aducanemab, lecanemab and donanemab are approved.
Several pre-clinical studies showed that medications used for the treatment of cognitive impairment may impact bone function. Donepezil has been shown to affect energy metabolism and favour bone mass accrual in healthy young wild type mice[1]. Moreover improvement of bone quality by reducing the number of bone resorbing osteoclasts has been shown in donepezil-treated mice[2].
Osteoporosis and bone fractures are reported two-fold increased prevalence in subjects with AD, compared to healthy individuals at a similar age[3].
The epidemiological evidence suggest association between cognitive impairment and bone health (BMD and falls/fractures). The incidence of falls and fractures has been shown to be high in people with dementia in several studies. However, relationship between BMD and dementia is unclear and requires further studies. In a multicenter study of osteoporotic fractures, low BMD was found to be associated with lower cognitive scores in women[4]. It was also shown that higher rates of bone loss can be predictive of subsequent cognitive decline in older women[5] Moreover, an increased risk of dementia or AD was reported in subjects with history of distal radius, hip or spine fractures[6].
More studies are needed to further characterize the link between cognitive and bone disorders to facilitate development of novel therapeutic strategies.

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ESCEO5

SPECIFIC CONSIDERATIONS FOR THE MANAGEMENT OF OSTEOPOROSIS IN THE OLDEST OLD

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Osteoporosis and high fracture risk are lifelong considerations. Age is a major determinant of fracture risk and all other things being equal, fracture risk will rise with increasing years. Our ability to optimally manage bone health in the oldest old is impacted by several considerations. Firstly, despite advances in clinical care and policy, and the enormous efforts of bodies such as the IOF, fractures may still be viewed as an inevitable part of ageing; secondly, there is limited direct evidence for the efficacy of medications in this age group - sadly lack of evidence is sometimes interpreted as evidence of a lack of effect; thirdly, comorbidities such as renal impairment and gastrointestinal dysfunction become more common such that choosing an appropriate medication is less straightforward than at younger ages; fourthly, the body's ability to metabolise and handle medications may change with age, leading to the potential for greater risk of interactions, particularly given the frequency with which older individuals receive multiple medications.
In this session I will give an overview of the considerations relevant to the clinical assessment and management of osteoporosis and high fracture risk in the oldest old. I will address approaches across guidelines, issues of long-term efficacy and safety, focusing on a pragmatic approach to do the best for patients at high fracture risk in older age.

ESCEO6

SPECIFIC CONSIDERATIONS FOR THE MANAGEMENT OF OSTEOARTHRITIS IN THE OLDEST OLD

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With ageing populations, the 'oldest old' with osteoarthritis (OA) are rapidly increasing. Treatment options are few for this group and clinicians are increasingly challenged. With this in mind, ESCEO recently convened an expert working group to explore this issue.

While there is no agreed age cut point, generally 'oldest old' refers to those over 80 years old with high levels of dependence and co-morbidities. The high levels of multimorbidity in OA are highlighted in a Canadian insurance registry study included 500,000 participants, with 29% having hypertension, 20% depression, 19% chronic obstructive pulmonary disease, 10% diabetes and 6% congestive heart failure. This clearly presents a problem for many OA medications. Pain remains the main reason to treat OA, though in this age group, activity may limit weight-bearing pain.

The evidence base for any OA therapeutic interventions in the 'oldest old' is very poor. For various reasons, the mean age in OA trials is 60-65 yo, with few participants aged over 75. All OA guidelines recommend a mix of non-pharmacological and pharmacological therapies. The former involve muscle strengthening/ physical therapy (and compliance may be reduced in this group) and weight loss if needed; new anti-obesity therapies may offer some opportunities in obese and overweight though understanding safety in this group is needed.

SYSDOAs are recommended in ESCEO guidelines. Paracetamol is commonly used in this age group but analgesic benefits if any are small; dose and duration may be important for efficacy and safety. Polypharmacy will likely play a role in the pharmacokinetics of paracetamol (and other drugs) in the oldest old. Topical NSAIDs are likely safe and effective for some joint sites, but oral NSAIDs are problematic given the risks associated with co-morbidities and great care is required in monitoring patients using these agents. Intra-articular corticosteroids may offer some short-term relief for individual joints.

ESCEO7

THE DELINEATION OF ENDOTYPE AND PHENOTYPE TO IDENTIFY THE PATIENTS WITH KNEE OSTEOARTHRITIS WHO SHOULD BE TREATED

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The lack of successful OA clinical trials has made us reconsider who we should be treating – are there subgroups who may respond to a specific therapy? Most of us are familiar with the concept of a 'phenotype' – an observed disease characteristic; unfortunately this gives little clue as to a specific molecular pathways that drive the disease, which we term an endotype.

In OA trials we typically include patients with months of moderate-severe pain (chronic pain phenotype) and radiographic evidence of cartilage loss (cartilage phenotype). Some surgical studies have included patients with high degrees of malalignment, a mechanical overload phenotype. Others have included patients with synovitis, as an inflammatory phenotype. One problem with phenotypes is that the often overlap – for example, most patients with cartilage loss have some degree of synovitis. Recently machine learning has been employed to determine novel phenotypic clusters providing some insights.

Trials focusing on a cartilage phenotype have generally been disappointing, although sprifermin has shown some increase in MRI-detected cartilage after 18 months of therapy. Trials targeting subchondral bone marrow lesions with bisphosphonates were negative. In terms of analgesia, a trial of hand OA patients selected for chronic pain and the presence of synovitis and treated with methotrexate demonstrated benefits at 6 months. A novel neurotrophin modulator also demonstrated excellent analgesic benefits in a typical knee OA chronic pain phenotype.

In contrast, very few trials have targeted specific molecular pathways, because we are limited in the ability to identify specific biochemical or genomic biomarkers. And it is likely that multiple endotypes are involved in each phenotype. Work continues on identifying such biomarkers in blood and synovial fluid, with much focus on inflammatory phenotypes. These molecular changes likely occur years before any of the described OA clinical phenotypes.

ESCEO8

THE ROLE OF BIOMARKERS (IMAGING, BIOLOGICAL) IN THE IDENTIFICATION OF OSTEOARTHRITIC PATIENTS WHO SHOULD BE TREATED

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The objective of this lecture is to evaluate the role of biomarker modalities in identifying knee osteoarthritis (OA) patients with significant unmet medical needs, guiding symptomatic and structural treatment approaches. This presentation synthesizes findings from key clinical trials and cohort studies, focusing on biomarkers such as X-rays, magnetic resonance imaging (MRI) and biochemical markers. Analyses included the identification of structural progressors, associations between synovitis markers and cartilage degradation, and predictors of total knee replacement (TKR). Biochemical markers were integrated to evaluate their relationship with imaging findings and clinical outcomes. Imaging revealed critical distinctions among OA subgroups. Structural progressors were identified using baseline Kellgren-Lawrence (KL) grades, with KL3 patients demonstrating

faster progression than KL2. MRI-based evaluations of synovitis and effusion-synovitis predict structural degeneration and risk of TKR. Sustained synovitis was associated with a higher likelihood of cartilage loss and OA progression. Elevated levels of biological biomarkers such as IL-6 and MMPs were associated with enhanced cartilage degradation and synovitis severity, providing complementary insights to imaging data. The interplay between imaging markers, biological biomarkers, and clinical outcomes underscores the potential of imaging-guided stratification for personalized OA management.

In conclusion, imaging techniques are pivotal in stratifying OA patients based on disease severity and unmet medical needs, enabling targeted interventions. Baseline imaging markers, such as synovitis and effusion severity, along with biochemical markers, could predict progression and guide treatment strategies, from pharmacological therapies (e.g., NSAIDs, intra-articular injections) to surgical interventions like TKR. Further research should refine imaging and biomarker-based endpoints for disease-modifying OA drugs (DMOADs).

ESCEO9

PHARMACOLOGICAL MODE OF ACTION (PTHR1 AGONISTS)

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The opposing effects of parathyroid hormone on bone according to its intermittent or chronic elevation were characterised in the 1990s and led to the subsequent development of PTHR1 agonists. These now include teriparatide and abaloparatide. Teriparatide is a synthetic peptide analogue of the first 34 amino acids of human parathyroid hormone. In contrast abaloparatide is a synthetic peptide analogue of the first 34 amino acids of human parathyroid hormone related peptide (PTHrP).

In this presentation I will discuss the similarities and differences related to the mechanism of action of these two medications. Important concepts include the differential binding to the R^0 and R^G confirmation of the PTHR1 receptor, with abaloparatide binding more strongly to the latter, resulting in a sharper spike of cyclic AMP release. This may favour anabolic over resorptive activity; indeed theoretical models of the "anabolic window" will be discussed. The outworking of these mechanisms on measurable factors such as bone turnover markers will be evaluated and the presentation will set the scene for an informed interpretation of subsequent efficacy findings.

ESCEO10

ANTI-FRACTURE EFFICACY OF PTH R1A

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Osteoporotic fractures represent a significant clinical and socioeconomic burden, particularly among aging populations. Recent advancements in osteoporosis management have centered on therapies targeting bone formation pathways. Parathyroid hormone receptor 1 agonists (PTH R1A) have emerged as a novel class of anabolic agents with promising anti-fracture efficacy. This presentation explores the role of PTH R1A in reducing fracture risk, particularly vertebral and non-vertebral fractures.

The presentation will summarize the pathophysiology of osteoporosis, emphasizing the balance between bone resorption and formation, and the limitations of traditional antiresorptive therapies. Key findings from pivotal clinical trials evaluating PTH R1A efficacy in fracture prevention will be reviewed, with particular attention to the reduction in vertebral and hip fractures observed in diverse patient populations and also taking in account recent meta-analyses about the topic.

Practical considerations for incorporating PTH R1A into clinical practice will also be discussed, including patient selection criteria, and dosing strategies. Comparative efficacy with other available anabolic agents and future directions for research and development will be highlighted.

This presentation will aim to provide physicians with an evidence-based understanding of PTH R1A as an important option in osteoporosis management, enabling more informed therapeutic decisions to improve patient outcomes and quality of life.

ESCEO11

SAFETY OF PARATHYROID HORMONE RECEPTOR (PTHR1A) AGONISTS IN THE MANAGEMENT OF OSTEOPOROSIS

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Parathyroid hormone (PTH) and PTH-related protein (PTHrP) are hormones which play vital roles human bone metabolism/development, and have been targeted for therapeutic interventions in osteoporosis, namely through the development of the parathyroid hormone receptor agonists, abaloparatide and teriparatide. There is now considerable clinical trial and real world evidence to support the efficacy of these drugs in the treatment of osteoporosis.

It is, of course, important to balance efficacy of a medication against its safety profile. Whilst there were early rare observations of osteosarcoma in rats with high dose teriparatide treatment lifelong, this has not been borne out as a concern in human use. The vasodilating properties of these medications are well established, and may be associated with limited clinical side-effects; long-term cardiovascular safety has also been demonstrated. In this session we will discuss the safety of these medications, across a range of systems. We will consider the differences between teriparatide and abaloparatide and understand appropriate settings for their use in the context of efficacy and side effect profiles.

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ESCEO-DVO Symposium Abstracts

ESCEO-DVO1

THE ROLE OF BONE ANABOLIC TREATMENT IN THE GERIATRIC POPULATION

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Objective: Age is one of the most important determinants of fracture risk. Furthermore, comorbidities, reduced physical activity, and fall risk are strong risk factors for osteoporotic fractures. On the other hand, geriatric patients suffer from functional decline and reduced capacity of organ systems, which makes them highly vulnerable to stressors such as fractures. As teriparatide and romosozumab have been shown to be superior to oral bisphosphonates, many guidelines recommend first-line bone anabolic treatment for high-risk osteoporosis.
Methods: Expert opinion, review of the literature, and presentation of own scientific data.
Results: The proportion of patients with very high fracture risk according to the DVO (Dachverband Osteologie; umbrella organization of the German-speaking scientific societies dealing with bone health) risk calculator is quite high (about 50% in different studies) in the geriatric population. Characterization of the population reveals that patients have significantly reduced functional status, but only a small proportion has the most severe impairment of independence with special care needs. Furthermore, analysis of the presence of contraindications to bone anabolic drugs and antiresorptive drugs shows that almost all patients can be treated with at least any drug and that about 70% of the geriatric study population has no contraindication to any of the anti-osteoporotic medications.
Summary: The geriatric population includes many with very high fracture risk, whereas contraindications are rather rare, and most people still remain autonomous, which should be protected by considering anti-osteoporotic treatment consequently.

ESCEO-DVO2

MANAGEMENT OF PREGNANCY ASSOCIATED OSTEOPOROSIS

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Pregnancy and lactation-associated osteoporosis (PAO) is a rare, but severe form of premenopausal osteoporosis occurring predominantly during the last trimester of pregnancy or in the first months postpartum. The prevalence of PAO is estimated to be 4-8 for every million patients. However, because of the rarity of the disease a significant fraction of patients remains undiagnosed.
These patients are often undertreated, while the exact incidence of mild trauma leading to vertebral and non-vertebral fractures during pregnancy, puerperium and lactation remains unknown. The most common symptom of PAO is acute lower back pain due to bone marrow edema and vertebral fractures. Oftentimes, the diagnosis is difficult because patients do not present the common clinical risk factors for postmenopausal osteoporosis and these patients are generally healthy. As such, Bone Mineral Density (BMD) measurements are not available before the index pregnancy. If available, BMD results predominantly display a decreased Z-score, but it remains unclear whether the accelerated bone mass loss occurs before or during pregnancy. Therefore, the underlying pathophysiological mechanisms are not completely understood.
Beside increased weight-bearing and lordotic posture of pregnancy may predispose individuals with already low bone mass or skeletal fragility to low trauma spine fracture, genetic, environmental and endocrine factors, low calcium intake, vitamin D insufficiency as well as intake of glucocorticoids and heparin have also been proposed.
To date, about 200 case reports of PAO and one case-control study focusing on risk factor assessment have been reported, while evidence about long-term outcome with regard to subsequent fracture risk and the impact of treatment on BMD is currently missing. The aim of this talk is to summarize current knowledge on epidemiology, pathophysiology and treatment of PAO.

ESCEO-DVO3

OSTEONECROSIS OF THE JAW: NOVEL INSIGHTS AND CURRENT STATUS

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Osteoporosis is a chronic metabolic disease characterized by decreased bone mass and deterioration of microarchitecture leading to fragility and fracture. Antiresorptive therapy (AR) is one of the primary treatment options to prevent bone resorption and fractures. The most commonly used drugs are bisphosphonates or RANKL-inhibitors (denosumab), as well as a new sklerostin-inhibitor (romosozumab). Antiresorptive agents work by inhibiting osteoclast activity, thereby slowing the breakdown of bone tissue and maintaining bone density. Due to its mechanism, AR-drugs also play an important role in patients with osseous metastases to reduce further expansion.
Medication-related osteonecrosis of the jaw (MRONJ) is a rare side effect of AR-therapy. Data show that it occurs less frequently in osteoporosis patients than in patients with oncological indications due to lower dosing. The Pathogenesis of MRONJ was unclear for a long time and is still a subject of research. However, there are recent findings that indicate that local dental infections

play a key role.
Potentially pathogenic germs in the oral cavity, increase the risk of developing osteonecrosis of the jaw. This was shown in in vitro as well as in vivo large animal models. That understanding of the disease leads to new prophylactic strategies including optimization of oral hygiene and regular dental check-ups. Furthermore, new and innovative treatment options e.g. fluorescence guided surgical treatment have optimized the treatment outcomes and made surgical interventions less invasive.
Overall, MRONJ is a rare side effect in patients under AR therapy, which can successfully be treated surgically. Prevention and dental check-ups are vital for patients under AR-therapy and can prevent MRONJ.

ESCEO-DVO4

DEALING WITH ATYPICAL FEMUR FRACTURES

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Antiresorptive medications, including bisphosphonates (BPs) and denosumab (DMAB), are extensively utilized in the management of osteoporosis. While these drugs are effective in preventing osteoporotic fractures, the use of bisphosphonates is associated with rare but serious adverse events, such as osteonecrosis of the jaw and atypical femoral fractures (AFFs). An AFF is characterized by a spontaneous or low-trauma subtrochanteric or femoral shaft fracture, often complicated by delayed or nonunion and frequently occurring bilaterally. These fractures are classified as insufficiency fractures and commonly present with bone pain. Early detection of distinct radiographic signs, along with discontinuation of antiresorptive therapy, can potentially prevent the progression to completed atypical femoral fractures. Conservative management is recommended primarily for patients with incomplete fractures or severe comorbid conditions. For most cases of both complete and incomplete AFF, intramedullary nailing is considered the preferred treatment. Healing complications in atypical femoral fractures are an uncommon yet notable issue among users of antiresorptive drugs. Treatment with teriparatide (TPTD) following an AFF has shown promise in enhancing fracture healing, reducing the incidence of delayed union and nonunion, and shortening the time required for fracture recovery.

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ESCEO-IOF-IFCC Symposium Abstracts

ESCEO-IOF-IFCC1

WHY AND HOW SHOULD WE TEST BIOCHEMICAL MARKERS OF BONE TURNOVER IN 2025?

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Biochemical markers of bone turnover (BTMs) provide valuable insights into the dynamic processes of bone remodeling, reflecting the balance between bone formation and resorption. The International Osteoporosis Foundation (IOF) and the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) recommend serum procollagen type I N propeptide (PINP) and β-C-terminal telopeptide of type I collagen (β-CTX-I) as reference markers for the diagnosis and management of osteoporosis. This abstract reviews advancements since the 2011 IOF-IFCC position paper, emphasizing why and how BTMs should be integrated into clinical practice in 2025.

Recent evidence confirms that elevated BTM concentrations, including PINP and β-CTX-I, correlate with increased fracture risk in postmenopausal women, independent of bone mineral density (BMD). However, the interaction of BTMs with other risk factors, such as those in the FRAX® algorithm, remains underexplored. Importantly, BTMs can guide treatment decisions, monitor therapeutic efficacy, and improve patient adherence to anti-osteoporotic therapy. For example, reductions in β-CTX-I and PINP during treatment with antiresorptive agents are associated with fracture risk reduction.

Advances in assay harmonization have improved the reliability of BTM measurements, yet challenges remain. Standardized patient preparation and sample handling protocols are critical to minimize pre-analytical variability. While PINP and β-CTX-I are suitable for patients with normal renal function, the utility of the total PINP (tPINP) and β-CTX-I is limited in chronic kidney disease (CKD) due to renal retention. Alternative markers, such as bone-specific alkaline phosphatase (BALP), intact PINP (iPINP) and tartrate-resistant acid phosphatase isoform 5b (TRACP5b), have shown promise in distinguishing high and low bone turnover states in CKD-associated osteoporosis and warrant further exploration.

To optimize the use of BTMs in 2025, we recommend continued efforts toward assay standardization and the development of reference intervals across diverse populations. Incorporating BALP and TRACP5b into clinical workflows can improve fracture risk assessment, treatment selection, and monitoring in CKD-associated osteoporosis. Ultimately, BTMs offer a non-invasive, cost-effective tool for advancing personalized approaches to osteoporosis management, aligning with the growing emphasis on precision medicine in musculoskeletal health.

ESCEO-IOF-IFCC2

WHAT DO BONE TURNOVER MARKERS BRING TO THE CLINICIAN, IN THE SCREENING, DIAGNOSIS AND MONITORING OF OSTEOPOROSIS IN 2025?

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Objective: Understand the potential role of bone turnover markers in management of osteoporosis in 2025

Discussion: Not all physicians use bone turnover markers (BTMs). If they use bone turnover markers most will use CTX and P1NP. BTMs may be of value in the 1st year after starting medication as changes in DEXA are not yet apparent. A lack of change in bone markers may reflect adherence or lack of response. Bone turnover markers may measure the response to anabolic regimen such as PTH agonist. The anabolic response may wean by 18 months but may persist for 36 months or longer. BTMs may be of value in monitoring bisphosphonate holidays and suggest when to restart an oral bisphosphonate. They may be helpful in following Denosumab discontinuation and judging the need for repeat administration of iv zoledronic acid.

BTMs may also play a role in the initial evaluation when using FRAX with DEXA is close to but below treatment threshold by predicting rate of future bone loss. BTMs may also show the efficacy of an osteoporosis medication used in a patient who is on a medication which results in bone loss (e.g. aromatase inhibitors). BTMs may also be helpful in understanding a lack of BMD response on medication. BTMs may helpful in identifying patients with unexplained high bone turnover who may need a workup for secondary causes. BTMs may be of value in the management of CKD associated osteoporosis.

Barriers to use of BTMs include reimbursement by insurance payors, slow turnaround time, fasting requirement and varying reference values.

Conclusions: Bone turnover markers or bone status indices have the potential to help the clinician in osteoporosis management

ESCEO-IOF-IFCC3

WHAT IS THE ROLE OF BONE TURNOVER MARKERS IN CHRONIC KIDNEY DISEASE-ASSOCIATED OSTEOPOROSIS?

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Chronic kidney disease (CKD) is highly prevalent among patients with osteoporosis and associated with an increased fracture risk. Progressive loss of renal function induces disturbances of mineral metabolism, severely affecting bone remodeling, mineralization, volume, and material quality. These disturbances

ultimately compromise bone strength and result in a condition that is increasingly referred to as CKD-associated osteoporosis. Skeletal remodeling in CKD shows great variability, from high turnover to abnormally low turnover.

Different therapeutic strategies for CKD-associated osteoporosis may be considered depending on the state of bone turnover. An assessment of skeletal remodeling is therefore key prior to formulating a treatment plan for bone fragility in CKD. Currently, circulating parathyroid hormone (PTH) is recommended for routine evaluation of bone turnover in CKD, but its use is flawed by a wide biologic variability, a large range of uncertainty, and J- or U-shaped associations with fracture risk and mortality. In contrast, both total alkaline phosphatase (ALP) and the bone isoform BALP demonstrate lower variabilities and positive linear associations with risk of fractures in these patients and may outperform PTH and bone mineral density by DXA in fracture risk prediction.

Importantly, the biomarkers of bone turnover currently recommended for the management of postmenopausal osteoporosis are not suitable in the setting of CKD, as they accumulate with kidney dysfunction. Instead, intact procollagen I N-terminal propeptide, tartrate-resistant acid phosphatase 5b, and BALP are not affected by renal function and can be measured in routine laboratories. Studies comparing these biomarkers to bone biopsy findings reveal decent diagnostic accuracies for both high and low bone turnover.

Bone turnover markers may be useful for treatment choice between antiresorptive and anabolic agents and for estimation of treatment responses in CKD. Higher levels of bone turnover markers associate with greater BMD gain following anti-resorptive therapy in late-stage CKD. Higher levels of bone turnover markers can also be used for risk-prediction of a hungry bone response with severe hypocalcemia following denosumab injections, parathyroidectomy, and initiation of calcimimetics for the control of severe hyperparathyroidism.

Bone turnover markers are thus essential for evaluation of bone turnover, risk-evaluation, treatment initiation, and assessment of treatment response in CKD-associated osteoporosis.

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ESCEO-ISGE Symposium Abstracts

ESCEO-ISGE1

THE ROLE OF SEX STEROIDS IN THE HEALTH OF THE MUSCULOSKELETAL SYSTEM: A LIFETIME JOURNEY

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Changes in body composition that occur in women at midlife also affect lean muscle mass, which, as opposed to fat mass, seems to decrease. Although sarcopenia cannot be currently attributed to the menopause, this degenerative process is more evident in ageing women than ageing men and seems to occur more rapidly after the menopause. However, MHT does not seem to confer a benefit in terms of gain in lean body mass. Although earlier studies had indicated preservation of muscle in women treated with MHT compared to placebo studies from large trials have not confirmed these results. Data from WHI bone mineral density (BMD) centers showed that lean body mass loss was smaller with either estrogen or estrogen-progestin treatment at 3 years compared to placebo, however, this result was lost by 6 years, with no differences between placebo and HT treatment groups. Similarly, the Danish Osteoporosis Prevention Study (DOPS), found no significant difference between treatment and control for change in lean body mass over 5 years. WHI data have revealed that estrogen and estrogen-progestin treatments result in less joint pain compared to placebo. Moreover, women treated with MHT develop less carpal tunnel syndrome. The WHI has also demonstrated a reduction in the percentage of women who undergo joint replacement surgery among women taking MHT compared to placebo, possible indicating a role for MHT in preservation of cartilage. Estrogen-progestogen treatment also seems to have a positive effect on intervertebral disc height, which correlates with T-score. Adequate disc height is important for the maintenance of shock-absorbing properties of the intervertebral disc and protecting the spine from vertebral compression fractures. Osteoporosis-related bone fractures decrease with years of MHT use. Stopping MHT, on the other hand, determines significant bone loss and increases risk of hip fracture as early as 2 years after stopping treatment.Research however is still lacking and should be promoted for a comprehensive understanding of the effects of MHT when initiated early after the onset of menopause.

ESCEO-ISGE2

WHEN THE OVARIES FAIL EARLY: PROTECTING THE BONE

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Almost all hormones influence bone density. Receptors for estradiol, thyreostimulating hormone (TSH), follicle stimulating hormone, (FSH) adrenocortical hormone (ACTH), prolactin, growth hormone (GH), Ghrelin, leptin, oxytocin, and vasopressin are expressed on the bones. The most crucial hormone for the bone health is estradiol. Hypoestrogenism thin trabecular part of the bone, leads to perforation and loose of connections between trabecules. Gene affecting bone mineral density (BMD) are LRP5 and ESR1.Premature ovarian insufficiency (POI) is hypergonadotropic hypogonadism, hypoestrogesnim, oligo- amenorrhoea in women younger than 40 years of age. OBJECTIVE: to make comparison in bone mass density depending of amenorrhoic period in POI. SUBJECTS: I group: 364 women less than 5 years of amenorrhoea , 34.1± 3.2 years of age, BMI 20.9 ± 1.8 kg/m^2. II group: 312 subjects, 43.1 ± 2.9 years of age, 6-10 amenorrhoic years, BMI 22.3 ± 2.1 kg/m^2. III group : 212 women, 53.3 ± 4.1 years of age,11-20 amenorrhoic years, BMI 23.7 ± 2.0 kg/m^2. Blood analysis for FSH, luteinizing hormone (LH), prolactin, estradiol, progesterone, testosteron, DHEAS, andristendion, , vitamin D, TSH were detected in all subjecst at 8 am. Hormone analysis were done by RIA. Bone mass density was measured on lumbar spine and hips (total and neck (by Lunar osteodensitometer). Statistics: Wilcoxon Mann Whitney test. RESULTS: significant difference was found between BMD between I vs. III group (T=-1.1 vs -2.1, p<0.01), and II vs III group (T= -1.2 vs -2.1 p<0.01). FSH and LH decreased during aging. Estradiol was low in all subjects, as well as progesterone. DHEAS significantly dereased by aging (4.1 ± 0.9 vs /2.7 ug/mL P<0.01). Testosteron and androstendion were low normal in all groups. Vitamin D was low in all groups. Low body weight, poor calcium intake, lack of regular exercise in hypoestrogenic women decreased trabecular bone score indicating accelerated loss of microarchitecture integrity. Estradiol therapy in adequate dosages has to be included at the time of diagnosis of POI. It is the first line therapy being the most potent stimulator of recovering homeostatic bone mechanism. All other insufficient hormones have to be added in order to protect bone density.

Key words: premature ovarian insufficiency, osteoporosis, estradiol

ESCEO-ISGE3

MENOPAUSE AND THE BONE: A MATTER FOR GYNECOLOGISTS

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Since premenopausal period bone loss can occur, due to a decrease of progesterone and, after, of estrogen levels. During menopause and postmenopausal periods, bone loss increases progressively, leading to a skeletal conditions as osteopenia or osteoporosis, with an increased risk of fracture. Gynecologist, in clinical practice, is the specialist that can prevent this progressive bone loss and treat osteopenia/osteoporosis reducing related fracture risk.

It is well known estroprogestins prescription in pre-perimenopause can prevente bone loss and reduce significantly the risk of fracture in the subsequent menopausal period.

During menopausal and postmenopasal periods, menopausal hormone therapy (MHT) with estrogen (+ progestin in women with uterus), tibolone, or tissue selective estrogen complex (TSEC) can efficiently reduce the rate of bone loss. For standard dose of estrogen (e.g., 0.625 mg of conjugated estrogen or equivalent) a reduction of fracture risk has proven, while for lower doses (0.3 mg of conjugated estrogen or equivalent) the ability to prevent bone loss in comparison with placebo was demonstrated. Thus, MHT, even if prescribed for climacteric syndrome, can prevent in a significant manner bone loss and reduce the osteoporosis-related risk of fracture. MHT should be prescribed starting under 60 years of age or 10 years past menopause onset. If a woman do not present with vasomotor symptoms, gynecologist can choose Selective Estrogen Receptor Modulators (SERMs), which do not improve neurovegetative symptoms, but can reduce bone loss and risk of fracture. In particular, today we have two SERMs for which was reported a reduction of fracture risk: Raloxifene (significantly reducing vertebral fracture risk), and Bazedoxifene (significantly reducing vertebral fracture risk and, in a high-risk population, non-vertebral fracture risk). Thus, based on age or reproductive period of a woman, gynecologist can choose a therapy in a personalized manner. Evidently, for women with different conditions or age range, the choice may be on Bisphosphonates (antiresorptive agents), Denosumab (anti-RANKL antibody), or anabolic agents (Teriparatide, Abaloparatide) o dual-agent as Romosozumab (anti-sclerostin antibody).

In this way, the gynecologist has a position from which he can play a central role above all not only in the prevention, but also in the treatment of osteoporosis and related fracture.

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ESCEO-EMAS Symposium Abstracts

ESCEO-EMAS1

ASSOCIATION BETWEEN EARLY MENOPAUSE AND FRACTURE RISK

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Estrogen acts both at the osteoclast and osteoblast level, either directly through the estrogen receptor (ER)-alpha or indirectly, through the ER-beta in the cells of the immune system (T- and B-lymphocytes and macrophages). It also acts at the osteocyte level, by increasing the expression of the protein semaphorin 3A and decreasing the production of sclerostin. Therefore, menopause-associated estrogen decline leads to decreased osteoblastic and increased osteoclastic activity, predisposing to impaired bone quality.

Although the average age at menopause is 51±1 years, 10% of women enter menopause before the age of 45, a state termed "early menopause" (EM). A subcategory of EM is "premature ovarian insufficiency" (POI), defined as the menopause occurring earlier that 40 years, the prevalence of which is estimated at 1-3% of the menopausal population. Both women with EM and POI demonstrate a 2-fold increased risk of osteoporosis. Moreover, they may increase the risk of sarcopenia, since EM is associated with decreased muscle mass and POI with decreased muscle strength and performance. EM is also associated with increased risk of frailty, irrespectively of age and other risk factors.

All these data indicate increased propensity to falls and, subsequently, fractures. Indeed, according to a meta-analysis of 18 cohort studies (n=462,393 postmenopausal women), women with EM demonstrate a 1.4-fold fracture risk compared with those of normal age menopause (>45 or >50 years). This risk was not significant in women with POI, potentially indicating the beneficial role of hormone replacement therapy (HRT) in this population. Although, interventional randomized controlled studies (RCTs) conducted specifically in women with EM or POI are lacking, estrogen increases both spinal and femoral bone mineral density (BMD) in a dose-dependent manner and decreases the risk of all types of fractures in all ages, irrespectively of baseline fracture risk.

In conclusion, both EM and POI predispose to increased fracture risk, due to decreased BMD and increased risk of sarcopenia and frailty in later life, independently of age. However, future RCTs are needed to clarify the optimal dose and duration of therapy, as well as the post-HRT intervention strategy.

ESCEO-EMAS2

OVARIAN VOLUME AND BONE MINERAL DENSITY IN POSTMENOPAUSAL WOMEN

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Objective: To investigate the possible link and explore the underlying pathophysiological mechanisms affecting changes in ovarian volume and bone density in postmenopause

Material and Methods: A review of the literature was conducted using publicly available databases such as PubMed. Studies of interest included those reporting data on ovarian volume, bone density, and relevant metabolic parameters (BMI, WHR, SHBG) in both pre- and postmenopausal women, where available. Data on age and menopausal status were also considered.

Results Ovarian volume is reduced after menopause, coinciding with a rise in cardiovascular risk factors, particularly central obesity, which is strongly associated with insulin resistance. While the precise relationship between insulin resistance and ovarian volume in postmenopausal women requires further investigation, studies in reproductively active women with PCOS demonstrate a link between higher insulin levels and increased ovarian blood flow, suggesting a potential trophic effect of insulin on ovarian function. However, the direct impact of insulin resistance and weight status on ovarian volume in postmenopausal women remains unclear. In contrast, the role of insulin resistance in bone health is more established. Available studies indicate that insulin resistance, synergistically with estrogen deficiency, is a major determinant of bone density, highlighting the complex interplay between metabolic status, hormonal changes, and skeletal health in postmenopausal women.

Conclusion. Ovarian volume in postmenopausal women is associated with metabolic parameters, potentially reflecting underlying insulin resistance. These findings suggest a complex interplay between ovarian function, metabolic status, hormonal milieu, and bone health in postmenopausal women, warranting further investigation.

ESCEO-EMAS3

WHAT DO CURRENT GUIDELINES RECOMMEND ABOUT MHT AND OSTEOPOROSIS PREVENTION IN MENOPAUSAL WOMEN?

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Postmenopausal osteoporosis is a result of accelerated bone loss after menopause as a consequence of prolonged estrogen deficiency. It is well-established from randomized clinical trials that menopausal hormone therapy (MHT) provides protection from bone loss in postmenopausal women. Different preparations of estrogen (oral, transdermal) with and without progestogens, as well as tibolone and selective receptor modulators are effective. Lower than standard doses of estrogen have also shown improvements in bone mineral density. MHT also provides protection from osteoporosis-related fractures in postmenopausal women not selected on the basis of osteoporosis, as was shown in the Women's Health Initiative (WHI) trial.

Positive effects on balance may contribute to the rapidly reduced risk of fracture after the initiation of MHT. However, after discontinuation of MHT treatment, accelerated bone loss and loss of protection from fracture occur, although no rebound fractures were seen in the WHI trial. Guidelines recommend women with premature ovarian insufficiency and early menopause to take MHT until the age of natural menopause to reduce the risk of osteoporosis and other health risks. Since MHT has not been investigated in women with established osteoporosis, it should not be the first line treat treatment for this group of women. It is still a controversy whether MHT should be used as first line treatment for prevention of osteoporosis in women younger than 60 years with natural menopause and without vasomotor symptoms. Recommendations about MHT and osteoporosis prevention by different guidelines will be discussed.

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WORLD CONGRESS ON OSTEOPOROSIS, OSTEOARTHRITIS AND MUSCULOSKELETAL DISEASES

Abstract Book

EUGMS-ESCEO Symposium Abstracts

EUGMS-ESCEO1

PREVENTING FRAGILITY FRACTURES IN THE OLDEST OLD: SPECIAL CONSIDERATIONS?

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Fragility fractures in the oldest old (individuals aged 85 and above) represent a major and growing healthcare burden with significant impacts on functional outcomes and quality of life. Firstly absolute risk is high since age is a key determinant of fracture risk and besides, especially in this age group fractures are associated with high morbidity, mortality, and diminished quality of life. For the oldest old, both those who have experienced fractures and those at high risk, osteoporosis management and fracture prevention pose unique challenges due to factors such as physiological aging, frailty, polypharmacy, and comorbidities. Special considerations are needed to tailor osteoporosis management to the oldest old, as standard clinical approaches may not be directly applicable.

Furthermore, the oldest old are often underrepresented in clinical trials, particularly in randomized controlled trials (RCTs) where older participants are typically healthier than those seen in real-world settings. This makes the translation of trial outcomes to clinical care for this population challenging.

This presentation will address the complexities of fracture risk assessment in the oldest old, with a focus on tools that integrate clinical judgment with evidence-based guidelines. Key considerations will include the role of bone mineral density (BMD) testing and vertebral fracture assessment, alternative diagnostic markers, and the role of clinical risk factors in fracture prediction. Additionally, the evidence of pharmacological interventions in the oldest old will be discussed, considering multimorbidity, polypharmacy, frailty, and limited life expectancy. Non-pharmacological strategies will also be addressed. Ethical and practical aspects of treatment decisions in the oldest old will be highlighted, emphasizing the importance of individualized care that balances fracture prevention with the risks of polypharmacy and potential adverse effects. The goal of this session is to promote a nuanced understanding of osteoporosis and fracture prevention in this vulnerable group and encourage innovative and personalized approaches to optimize care and outcomes for the oldest old.

EUGMS-ESCEO2

PREVENTING FRAGILITY FRACTURES: SIMILARITIES AND DIFFERENCES IN APPROACHES BETWEEN LMICS AND EUROPE

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Preventing fragility fractures within a population or country, requires a sequence of steps: systematic fracture risk assessment of individuals with clinical risk factors (CRFs) for fracture, understanding of the level of fracture risk above which evidence supports intervention, initiation of both non-pharmacological and pharmacological treatments, monitoring of treatment adherence, timely identification of fractures should they occur, and intermittent re-evaluation of fracture risk and treatment. This pathway of care requires health workforce education and training, established models of care (e.g., fracture liaison services [FLS]), with regular audit and review. Such care pathways are well established in high-income countries, but only 16% of the world's population lives in a high-income setting.

Countries with a gross national income per capita of <$14,005/year are described as LMICs (n=136); <$1,145 if a low-income country. Currently most FLS are found in high-income countries, e.g., in sub-Saharan Africa only 2 FLS are listed within the Capture the Fracture programme, whereas FLS in South America and Southeast Asia are expanding rapidly. Compared to Europe, approaches will need to vary for multiple reasons, e.g., scale (e.g., China and India now have 280 and 149 million people age 60 years and older), variation in CRFs for fracture (e.g., HIV is more prevalent; malnutrition likely contributes more to fracture risk).

Multiple challenges to fracture prevention currently exist in LMICs. There are currently important evidence gaps; validated fracture risk assessment approaches are needed that consider contextually relevant CRFs and avoid reliance on inaccessible DXA scanning, country-specific intervention thresholds are needed, non-pharmacological management needs to be co-developed and context-specific (e.g., baobab juice and soya chunks are calcium-rich). The lack of osteoporosis medicines on the WHO essential medicines list, is a major barrier to treatment access. In many LMICs health systems have evolved to provide episodic, acute care, for infectious and maternal health – now preventative and long-term care, often of multimorbidity, is needed.

Fortunately, opportunities exist for fracture prevention approaches in LMICs through, e.g., access to generic pharmaceutical agents, integration with well-established HIV programmes, and a culture of monitoring & evaluation within health systems. However, given rapidly increasing longevity, development is needed now, to curtail future fracture burdens.

EUGMS-ESCEO3

INTEGRATING FALL RISK PREVENTION WITHIN FRACTURE MANAGEMENT- PRACTICAL STEPS TO INTEGRATE MANAGEMENT

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Osteoporosis fractures cause much morbidity, mortality and economic cost to health and social care services. In the pathogenesis of low trauma fragility fractures such as at the hip, wrist, humerus and pelvis, there are two important determinants: bone fragility (osteoporosis) and propensity to falls. Both in the prevention of first fragility fractures and in the management of patients who have suffered a fracture, we can intervene, firstly by prescribing osteoporosis medication to strengthen bone, and secondly to assess for and implement measures to reduce the risk of falls (and therefore further fractures).

The World Falls Guidelines (WFG), a collaboration of 96 world experts from 39 countries, provide a framework on how to implement falls prevention in the post-fracture rehabilitation process (Montero-Odasso et al, Age Ageing 2022). The WFG algorithm classifies all injurious falls (including those with fragility fractures) as being at high risk of further falls and advises a multifactorial fall risk assessment followed by a individualised tailored intervention. Important aspects include assessments of gait, balance, medications, environment, nutrition, as well of cardiovascular, musculoskeletal, neurological and cognitive systems. Appropriate interventions may consist of strength and balance exercises, deprescribing, environmental modification, diagnosing and treating relevant medical conditions, and optimising vision and nutrition.

Involvement of ortho-geriatricians working with multidisciplinary teams have made a huge difference in the treatment hip fracture patients to implement the required guidelines. For other fragility fracturs the development of Fracture Liaison Services (FLS) have proven to be the key to identify patients that need appropriate secondary fracture prevention. However, it is important that FLS includes falls assessment and onward referral to appropriate fall prevention pathways to optimise effectiveness.

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ESCEO-OARSI Symposium Abstracts

ESCEO-OARSI1

CLASSIFICATION CRITERIA OF EARLY-STAGE SYMPTOMATIC KNEE OSTEOARTHRITIS: UPDATES OF THE OARSI INITIATIVE

A. Mahmoudian[1,2], L. K. King[3], J. W. Liew[4], Q. Wang[5], T. Appleton[6,7,8], M. Englund[2], I. K. Haugen[9], L. S. Lohmander[10], J. Runhaar[5], A. Turkiewicz[2], T. Neogi[4], G. A. Hawker[3]

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Objective(s): As an initiative by Osteoarthritis Research Society International (OARSI), our aim is to develop, refine, and validate EsSKOA classification criteria.
Material and Methods: We utilize the American College of Rheumatology (ACR) and European Alliance of Associations for Rheumatology (EULAR) framework for criteria development, which incorporates: 1) generation of a list of candidate items that should be considered in development of the criteria; 2) data collection and analysis to examine the ability of the candidate items, individually and in combination, to discriminate people with EsSKOA from other causes of knee symptoms (mimickers) and from individuals with established knee OA; 3) informed by the evidence, a consensus-based decision analysis process to identify factors (and relative weights) that influence the probability that the individual has EsSKOA; and finally, 4) refinement and validation.
Results: We have completed Phase 1 – item generation. We have solicited clinician-, researcher-, and patient perspectives, and used multiple methods to generate a list of candidate items potentially useful in identifying EsSKOA. This included an online survey of OARSI members, a scoping review of the literature, and post-hoc analysis of a qualitative study of people with knee OA, which informed a three-round modified Delphi exercise via online surveys. This work along with a cross-sectional survey of individuals with knee OA, identified candidate items in 7 domains. Additionally, we surveyed a diverse international group of clinicians across various disciplines, including sports medicine, family medicine, physical therapy, orthopedic surgery, and rheumatology, to identify common mimicker conditions in the differential diagnosis of undiagnosed knee symptoms. In Phase 2, redundant items will be consolidated to develop a parsimonious set of items for consideration. Phase 2 will generate the evidence base for Phase 3 criteria development.
Conclusion(s): Despite past three decades of intensive research efforts, we have yet to see regulatory approval of a novel therapy that prevents, slows or halts knee osteoarthritis (OA) progression. Establishing classification criteria to identify individuals with Early-stage Symptomatic Knee OA (EsSKOA) will usher in a new era of clinical trials for promising OA therapies in individuals at a disease stage when disease-modifying interventions may be more likely to succeed.

ESCEO-OARSI2

DIAGNOSTIC CRITERIA FOR EARLY-STAGE KNEE OSTEOARTHRITIS: OPPORTUNITIES AND CHALLENGES

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Despite the high prevalence of knee OA and its burden to patients and healthcare systems, the diagnosis of knee OA is not straightforward. Criteria used in clinical practice to diagnose knee OA include the ACR-criteria, EULAR criteria, and NICE criteria. Unfortunately, ACR and EULAR criteria seem to identify patients at late stage disease only and NICE criteria showed low specificity for knee OA, which could hamper the acceptance of the diagnosis among clinicians.
With a lack of treatment options that can cure OA, there is general consensus that a shift in focus towards early diagnosis and treatment is warranted. By identifying OA patients early in the disease, treatment can potentially start prior to the occurrence of irreversible joint damage, before pain becomes chronic and triggers sensitization of the central nervous system, and before severe decline in physical functioning has occurred. In theory, in the early phase of OA, treatment options are applied when the disease is more amenable to modification.
To facilitate the diagnosis of early-stage knee OA in clinical practice, CREDO (CRiteria for Early Diagnosis of Osteoarthritis) was developed and validated, using a national cohort of 761 patients aged 45-65 years who presented with knee pain in primary care and were followed for 10 years. The lack of a gold standard for early-stage knee OA posed a major challenge to CREDO. Methods to overcome this challenge and for development and validation of CREDO will be discussed during the symposium. Final set of criteria included patient characteristics (age and BMI), three individual WOMAC questions, and items from physical examination (joint line tenderness and effusion). CREDO showed

acceptable discriminatory ability (AUC 0.75 ± 0.002) and good internal and external validation results. Ongoing activities include transforming the criteria into clinically useful tools, such as a risk calculator and a decision tree, and evaluations of potential treatment options for patients diagnosed with early-stage knee OA, such as exercise therapy. These challenges and opportunities for early-stage knee OA diagnosis will be addressed during the symposium.

Sources:

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SICOT-ESCEO-IOF Symposium Abstracts

SICOT-ESCEO-IOF1

FRAGILITY FRACTURES OF THE PELVIC RING – MINIMAL INVASIVE TREATMENT OPTIONS

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Fragility fractures of the pelvic ring, primarily affecting elderly individuals with osteoporosis or low bone density, represent a significant clinical challenge due to their associated morbidity, prolonged recovery, and increased risk of mortality. These fractures often result from low-energy trauma, such as falls from standing height. The management of pelvic ring fractures has traditionally involved complex, open surgical interventions, but advances in minimally invasive techniques have revolutionized treatment strategies, offering promising alternatives.

Minimally invasive treatment options for fragility fractures of the pelvic ring aim to reduce surgical trauma, shorten recovery times, and minimize complications. Key approaches include percutaneous fixation using screws, plates, and specialized devices that stabilize the pelvic ring while avoiding large incisions.

While the benefits of minimally invasive approaches are clear, careful patient selection is critical. Factors such as fracture type, bone quality, and overall health status must be considered to optimize outcomes.

SICOT-ESCEO-IOF2

DECISION MAKING IN THE MANAGEMENT OF FRAGILITY FRACTURES OF THE ACETABULUM

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Objective

The incidence of fragility fractures of the acetabulum is increasing in the elderly population. The optimal treatment is still controversial. The main challenges are the management of frail patients with comorbidities and bad bone quality, which makes it challenging to obtain a good reduction and fixation of the fracture.

Material and methods

We retrospectively analyzed 54 patients over 65 years old treated surgically between 2017 and 2023 in our institution with, at least 1 year of follow up, we excluded polytrauma patients.

We used the Letournel classification to classify the fracture and used the Matta criteria to judge the reduction quality of the fracture.

We evaluated the clinical and radiological outcome in outpatient clinic and used the Harris hip score and Womac scale.

Results

We surgically treated 54 patients (40 male, 14 female), mean age 72yo (65-88).

Most common fracture patterns were Both column (30%), Anterior column (22%) and Anterior column posterior emi transverse (15%).

We mostly used as anterior approach modified Stoppa with and without iliac window (22 cases), we treated percutaneously 4 patients. Only 3 patients were treated with fixation and hip replacement.

Mean follow-up was 2.2 years, quality of reduction was good in 56% o patients, imperfect in 40% and poor in 6%.

Mean Harris Hip Score was 82(good), mean Womac score 22.

Mortality at 1 year 9%, hip prosthesis conversion at 1 year 13%.

We had an overall 20% complication rate (2 superficial infections, 2 deep infections, e femoral head AVN, 2 peritoneal lesions, 2 bleeding from obturator vessels, 1 algodistrofic syndrome).

Conclusion

Our results suggest that fixation of fragility acetabular fractures is a feasible treatment with satisfactory results and reasonable conversion rate to prosthesis. Even if often the quality of the reduction isn't perfect, the elderly, as shown in literature, seems to tolerate better mild arthritis changes of the hip.

SICOT-ESCEO-IOF3

INTERDISCIPLINARY COMPREHENSIVE CARE OF FRAGILITY FRACTURES IN GERMANY

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Objective: Germany has unique traits regarding interdisciplinary comprehensive care of fragility fractures.

Material and Methods: Differences between the „German approach" to fragility fractures compared to other European practices were analyzed by literature review and comparison of current national guidelines.

Results: There are remarkable differences when comparing current German standards to our European neighbors, with regard of diagnostics and treatment of osteoporosis, and orthogeriatric comanagement.

Concerning osteoporosis treatment, FRAX and its' derivatives are commonly used in Europe to estimate fracture risk. Thus, national osteoporosis guidelines base their treatment recommendations on the predicted 10-year fracture risk, calculated from 12 risk items. When using the risk calculator from the 2023 German Dachverband Osteologie guideline on osteoporosis (DVO-Leitlinie) 36 risk factors are used to predict fracture risk over a three-year period. Therby the German DVO Leitlinie especially factors imminent fracture risk in. Specific therapeutic recommendations vary across Europe, as the definition of high vs. very high fracture risk differ.

In Germany only a minority of patients with a fragility fracture are enrolled in a fracture liaison service (FLS). The national osteoporosis guideline recommends structured post fracture care, but the number of hospitals that offer FLS is low, and the thoroughness of secondary fracture prevention variegates.

The implementation of structured interdisciplinary care of

proximal femoral fractures has been boosted greatly by the mandatory guidelines of the federal joint committee (G-BA) in place since January 2021. Due to this legislation hospitals treating proximal femoral fractures have been required to ensure that next to specific exigencies regarding surgical treatment, also geriatric and physiotherapeutic comanagement are implemented. Penalties when disregarding this regulation, have led to most trauma departments nowadays having orthogeriatric comanagement.
Already prior to the GBA- regulations, hospitals implementing surgical and geriatric cotreatment for all fragility-fractures, could be certified as geriatric trauma centers (Alters-Trauma-Zentrum). Within the last ten years nearly 200 hospitals have been certified and thereby spurred geriatric traumatology in Germany.
Conclusion: Treatment of fragility fractures in Germany has made great progress by implementing orthogeriatric comanagement and new osteoporosis guidelines emphasizing imminent fracture risk. Nevertheless, treatment reality in Germany and Europe leaves room for improvement. Learning from each other's successes and failures will help to further improve fragility fracture care.

Disclosures: speaker's fee; Medi, advisory activities: UCB

SICOT-ESCEO-IOF4

FIFTEEN YEARS OF EXPERIENCE WITH ATYPICAL FEMUR FRACTURES

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[1]Department of Orthopedic Surgery and Department of Biomedical and Clinical Sciences, Linköping University, Linköping , Sweden

Background: Atypical femur fractures (AFF) were first identified in 2005, demonstrating a strong correlation with bisphosphonate therapy and reduced bone turnover. Despite advancements, AFF continues to present challenges for researchers and clinicians concerning the underlying pathophysiology, diagnostic criteria, optimal surgical interventions, and the influence of bisphosphonate treatment duration on AFF risk relative to the reduction of fragility fractures.
Methods: The epidemiology and radiographic characteristics of AFF were analyzed using radiographic adjudication and Swedish Registers. Histological analyses and sequential radiographs were employed to examine the healing process of AFF following intramedullary (IM) nailing. Register data were utilized to compare the reoperation risk in AFF patients with those having other femoral shaft fractures. Ongoing international collaborations aim to further elucidate the impact of bisphosphonate treatment duration on AFF risk.
Results: Our studies revealed a strong association between bisphosphonate treatment and AFF, which was dependent on the treatment duration. In a small prospective study, no delays in the healing response were observed in patients treated with IM nailing. Register studies indicated an increased rate of reoperations in patients with complete AFF, although these reoperations were due to reasons unrelated to AFF. The use of IM nails with fixation in the femoral head and neck for treating complete AFF significantly reduced reoperations compared to IM nails with standard proximal interlocking screws.
Conclusion: This presentation will cover the currently accepted pathophysiological mechanisms underlying AFF. It will discuss the recommended surgical treatments and identify which interventions may be unnecessary for achieving successful surgical outcomes. The importance of accurate diagnosis and methods to achieve it will also be addressed.
Keywords: Atypical femur fractures, bisphosphonates, epidemiology, radiology, histology, bone matrix, microcracks, orthopaedics
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Disclosure: nothing to disclose.

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Meet-the-Experts Abstracts

MTE1

PAGET'S DISEASE OF BONE: MANAGEMENT LESSONS FROM PIVOTAL STUDIES

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Paget's disease of bone is a focal bone disorder characterised by increased bone remodelling and disorganised bone structure. There appears to be a genetic cause in some cases. Recent epidemiological studies highlight a decreasing incidence of the condition, mirrored by an apparent decreasing clinical severity. Pain is the most common presentation, but recent studies have suggested that such pain is commonly due to osteoarthritis at an unaffected site. Bisphosphonates have been shown to be effective in management of the disease, with zoledronate an effective and commonly used therapy. Patients with Paget's disease undergoing joint arthroplasty of an affected joint appear to have a more difficult time medically and surgically in the perioperative period, but implant longevity appears similar. Treatment guidelines have been produced for the condition by international societies and will be briefly reviewed.

EMD has no conflicts of interest to declare

MTE2

INFLUENCES OF PARENTAL HEALTH ON THE NEXT GENERATION BONE

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There is increasing evidence that in utero and early life exposures are important to lifelong bone health and fracture risk. Increasing bone mineral accrual during fetal life and childhood might delay the onset of osteoporosis.
In this session, we will outline the accrual of bone mineral throughout the life course and how observational and intervention studies have shown that parental health, lifestyle factors and diet, in particular maternal calcium and 25-hydroxyvitamin D [25(OH)D] status are associated with offspring bone mineral density. We will present findings from the MAVIDOS randomised controlled trial of vitamin D supplementation in pregnancy, which has demonstrated a positive effect of pregnancy vitamin D supplementation on offspring bone health into mid childhood.
Potential mechanisms for the effects of environmental exposures on early life programming of bone health, including epigenetic mechanisms, will also be discussed.

MTE3

FRACTURE RISK IN CANCER SURVIVORS : BONE FRAGILITY BEYOND METASTASES

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Major advances have been obtained in cancer treatment for the last ten years and a significant number of patients are now cured or benefit from prolonged remissions, even in the metastatic setting. The post-cancer phase is a new stage during which patients have to recover from medical treatments - which can be very demanding - and return to their personal, social, emotional and professional lives. Nevertheless, many of them suffer after-effects, remain tired and have limited physical capacity. These patients need to be offered a multi-dimensional medical assessment to identify areas of fragility and offer personalised care. With regard to bone health, in addition to the usual assessment, rheumatologists will reconstruct the patient's oncological history, the various therapies affecting bone that the patient has received and the outlook for the patient's oncological development (age, prognosis, maintenance treatment, hormonal status, weight change, etc.). A summary of all these elements will enable us to propose optimal bone management. Using practical examples, we will look at different oncological situations and treatments that affect bone and propose therapeutic approaches despite the absence of recommendations.

MTE4

ADVANCES IN THE MANAGEMENT OF OSTEOGENESIS IMPERFECTA

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Osteogenesis Imperfecta (OI) is a clinically and genetically heterogeneous group of diseases characterized by brittle bones. Though genetic mutations in COL1A1 and COL1A2 account for approximately 85-90% of OI cases, there are now more than twenty genes described, responsible for rare forms of OI
Drugs currently used to improve skeletal health in OI were initially developed to treat osteoporosis and clinical trials are ongoing to study their effectiveness in OI adults. Additionally, novel bone-protective agents are in preclinical studies and various phases of OI clinical trials.
Although clinical trial data are limited, bisphosphonates and teriparatide may be useful in improving bone mineral density. As of yet, no clinical trials are available that adequately evaluate the usefulness of current therapies in reducing fracture risk.
Several therapeutics, including teriparatide, setrusumab, anti-TGF-β antibodies, and allogeneic stem cells, are being studied in clinical trials. Preclinical studies involving Dickkopf-1 antagonists present promising data in non-OI bone disease, and could be useful in OI. Research is ongoing to improve therapeutic options for adults with OI and clinical trials involving gene-editing may be

possible in the coming decade.
Recently, the chemical chaperone 4-phenylbutyrate (4-PBA) has been proposed as an innovative drug for OI based on its ability to restore intracellular homeostasis, stimulate secretion, and ameliorate collagen-producing cell functions, positively affecting bone properties. N-benzylglycine showed a higher stability than 4-PBA and it represents a novel potential available compound to target altered homeostasis in OI with the aim to ameliorate the disease phenotype.
The presentation will focus on these different aspects of diagnosis and treatment.

MTE5

IS THERE A ROLE FOR SYSADOAS IN THE MANAGEMENT OF OSTEOARTHRITIS?

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Osteoarthritis (OA) is a highly prevalent chronic condition, particularly in aging populations, and represents a significant burden on healthcare systems and patient quality of life. The management of OA has traditionally focused on symptom relief through pharmacological and non-pharmacological approaches, while disease-modifying strategies remain elusive. Symptomatic Slow-Acting Drugs for Osteoarthritis (SYSADOAs), including compounds such as glucosamine, chondroitin sulfate, and diacerein, have been proposed as a therapeutic option to address the structural and symptomatic components of OA. This presentation evaluates the current evidence on the efficacy and safety of SYSADOAs in OA management. While some studies suggest that SYSADOAs may provide modest symptomatic relief and possibly slow the progression of structural damage, results across clinical trials remain inconsistent, often influenced by study design, product quality, and patient heterogeneity. Recent meta-analyses have highlighted the need for distinguishing between pharmaceutical-grade and over-the-counter products, as well as the importance of adhering to standardized treatment regimens. This session will also address ongoing controversies surrounding the cost-effectiveness of SYSADOAs and their integration into clinical practice guidelines. Emerging data from long-term studies and real-world evidence will be discussed to clarify their potential role in personalized OA management. Ultimately, the presentation aims to provide clinicians with practical insights into the use of SYSADOAs, fostering informed decision-making tailored to individual patient needs.

MTE6

VACCINATION AND MUSCULOSKELETAL DISORDERS

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Despite their undeniable benefits, the role of vaccines in patients with musculoskeletal disorders are seldom discussed. Emerging evidence suggests a bidirectional relationship between infectious diseases and musculoskeletal disorders, such as sarcopenia and osteoporosis, wherein infections can exacerbate muscle wasting and bone loss, and sarcopenia can impair immune function, increasing susceptibility to infections. This session explores the complex interplay between these conditions, emphasizing underlying mechanisms, clinical outcomes, and preventative strategies.
Acute infectious diseases, such as COVID-19, influenza, RSV, and pneumococcal pneumonia can accelerate sarcopenia, osteoporosis and fracture risk through systemic inflammation, oxidative stress, and catabolic pathways. Pro-inflammatory cytokines, including TNF-α and IL-6, play a central role in mediating muscle breakdown and bone loss during infections. Moreover, infections can lead to malnutrition, physical inactivity, and hormonal imbalances, further exacerbating musculoskeletal disorders. Conversely, sarcopenia impairs the immune response, reducing the body's ability to combat infections and recover from illness. This creates a vicious cycle that can worsen overall health outcomes. Patients with sarcopenia or osteoporosis are at greater risk of prolonged hospitalizations, frailty, and mortality when infected. Early recognition and targeted interventions, including nutritional support, resistance exercise, and anti-inflammatory treatments, are critical for managing sarcopenia in the context of infectious diseases.
Vaccination against these infectious diseases can indirectly protect musculoskeletal health by reducing the incidence and severity of infections, thereby minimizing inflammation-related muscle and bone loss and mobility restrictions. Despite the benefits, vaccination coverage in vulnerable populations, such as older adults, remains suboptimal. Public health initiatives emphasizing the importance of immunization for overall health, including muscle and bone health, are crucial.

MTE7

OSTEOPOROSIS MANAGEMENT IN TRANSGENDER PATIENTS

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Individuals with gender dysphoria experience a gender identity that differs from the sex assigned at birth: trans men are assigned female at birth (AFAB) but self-identify as male; trans women are assigned male at birth (AMAB) but identify as female; non-binary trans persons identify as neither exclusively male or female. In addition to social transition, trans persons may seek gender-affirming medical care, i.e. hormonal treatment and/or surgery inducing and maintaining body changes more congruent to the self-identified gender. Gender-affirming hormonal treatment (GAHT) in trans men consists of testosterone treatment; GAHT in trans women consists of a testosterone-lowering drug, nowadays often a GnRH analogue (GnRHa), and estradiol. In non-binary trans people, hormonal treatment is tailored to the individual needs (e.g. partial masculinisation, partial feminisation) using various non-standardized treatment regimens. Hormonal treatment of transgender adolescents consists of suppression of pubertal development with a GnRHa followed, if gender dysphoria persists, by GAHT usually from around age 16y.

Findings on bone health in people with gender dysphoria under GAHT have mostly been reassuring, so that for the majority of trans persons the same guidelines for maintenance of bone health and management of osteoporosis apply as for the general population. General screening of trans persons by DXA is therefore not recommended. Nevertheless, some trans persons are at increased risk of osteoporosis and may need a closer follow-up.

Both in trans men and trans women, bone mass is generally well maintained under GAHT at the commonly used dosages. However, before initiation of any treatment trans women (AMAB) have a lower bone mineral density (BMD), a smaller cortical bone size; a higher prevalence of low BMD and osteoporosis compared to healthy cismen; possibly resulting from a lower level of physical activity. Fracture risk in trans women ≥50y is greater than in cis men and similar as in cis women. Therefore, for trans women the threshold for referral for DXA assessment should be low if additional osteoporosis risk factors or poor compliance for GAHT. BMD assessment is also advisable in case midlife dosage lowering or cessation of estrogen treatment is considered.

There is a lack of data on bone health implications of the diverse individualized hormonal treatment modalities in non-binary trans persons. Monitoring of BMD is advisable for non-binary trans persons on individualized schemes involving low and/or irregular steroid hormone dosing, which may be suboptimal for maintenance of skeletal health.

Adolescent trans girls (AMAB), but not trans boys (AFAB), have a lower pretreatment BMD Z-score compared to the cis-gender reference. GnRHa monotherapy impairs physiologic pubertal BMD increase, resulting in decrease of BMD Z-scores both in trans girls and boys. Upon initiation of GAHT BMD and Z-scores increase with at least partial recovery. In short term assessments recovery of pretreatment values is often incomplete. This is mainly so in trans girls and there is a substantial prevalence of low BMD in young adult trans women. Long-term follow-up of adult trans persons treated since adolescence showed reassuring full BMD recovery in trans men and at the hip measurement sites in trans women, whereas persistent lower BMD values are observed at the lumbar spine measurement site in trans women. The latter may be related to issues of estrogen dosage. Close long-term follow-up of trans women on GAHT since adolescence is thus advisable and additional research in this area is needed.

In addition to the general bone health-promoting measures such as adequate intake of calcium and vitamin D, adequate physical activity, avoidance of alcohol and smoking, strategies to optimize bone health in trans persons include monitoring of adequacy of sex steroid exposure and patient compliance for GAHT. As to the use of DXA for risk assessment, current guidelines for the general population advise to use the NHANES reference for women to calculate T-scores both in women and men, so that there is no specific issue for T-score calculations in trans persons. There are no studies on the treatment of osteoporosis performed specifically in trans persons. Treatment decisions and treatment modalities for trans persons with high fracture risk can be based on the guidelines for osteoporosis in the general population.

MTE8

BIOCHEMICAL MARKERS OF BONE TURNOVER: WHEN AND WHICH?

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The dynamic process of bone remodeling is critical in maintaining skeletal health and integrity. Biochemical markers of bone turnover (BTMs) provide a non-invasive window into this process, offering insights that are imperative for the diagnosis and management of osteoporosis and other metabolic bone diseases. This session will explore the two primary categories of BTMs: bone formation markers, such as procollagen type I N-terminal propeptide (PINP), and bone resorption markers, like C-terminal telopeptide of type I collagen (CTX-I). We will discuss their clinical relevance in assessing fracture risk, monitoring therapy effectiveness, and their role in personalized medicine. Special attention will be given to the challenges of assay variability and the need for standardization to enhance the utility of these markers in clinical practice. The session aims to provide a deep dive into when each marker should be ideally utilized and which markers offer the most reliable clinical information for specific scenarios, including the impact of chronic kidney disease (CKD) on BTM interpretation. By the end of this session, participants will gain a thorough understanding of how to effectively integrate BTMs into their clinical toolkit to improve patient outcomes.

MTE9

GIOP: PRESENT AND FUTURE

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Glucocorticoid-induced osteoporosis (GIOP) remains the most common secondary form of osteoporosis, affecting up to 50% of patients receiving long-term glucocorticoid therapy. Despite its prevalence and well-defined pathophysiology, GIOP is frequently underdiagnosed and undertreated, leaving many patients at risk for fragility fractures. This session will provide a comprehensive overview of current strategies and emerging therapies for the prevention and management of GIOP, with an emphasis on practical considerations for daily clinical practice.

Glucocorticoids exert rapid and profound effects on bone, leading to increased bone resorption, decreased bone formation, and compromised bone quality. Fracture risk rises early, often within the first 3-6 months of glucocorticoid initiation, underscoring the importance of proactive bone health management. International guidelines recommend risk assessment and initiation of bone-protective agents for patients receiving ≥2.5 mg of prednisone (or equivalent) for ≥3 months.

This session will cover practical approaches to fracture risk assessment, including the use of fracture risk assessment tools with glucocorticoid adjustments and trabecular bone score (TBS) to refine risk prediction. Special attention will be given to the selection of pharmacologic interventions, with bisphosphonates (e.g., alendronate, zoledronic acid), denosumab and the role of anabolic agents (teriparatide, abaloparatide and romosozumab) will be explored, particularly for patients at high fracture risk.

Looking to the future, emerging data on combination and sequential therapies, as well as potential new targets such as sclerostin inhibitors and anti-inflammatory bone agents, offer promise for addressing unmet needs in GIOP management. Additionally, the session will address practical aspects of monitoring, including follow-up DXA scans, bone turnover markers, and strategies for de-escalation or transition of therapy after glucocorticoid tapering. Interactive case discussions will provide real-world applications and foster collaborative learning.

MTE10

MAGNESIUM, NUTRITION, AND MUSCULOSKELETAL DISORDERS

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Magnesium, a vital mineral involved in over 300 enzymatic reactions, plays a pivotal role in maintaining musculoskeletal health. Despite its importance, magnesium deficiency remains an under-recognized issue in clinical practice, often masked by nonspecific symptoms. This presentation will underscore the critical interplay between magnesium, nutrition, and the pathogenesis and management of musculoskeletal disorders, aiming to enhance physicians' awareness and clinical strategies.

Emerging evidence links magnesium deficiency to a spectrum of musculoskeletal disorders, including osteoporosis, sarcopenia, chronic low back pain, and fibromyalgia. Magnesium's contributions to bone health—through regulation of bone mineral density and parathyroid hormone secretion—are well-documented. Additionally, its influence on muscle function, including energy production, protein synthesis, and electrolyte balance, positions it as a key factor in preventing muscle weakness and cramps.

Dietary insufficiency, altered absorption, and increased renal excretion are common causes of magnesium deficiency, compounded by aging, chronic illnesses, and medication use, such as proton pump inhibitors and diuretics. While dietary magnesium intake from sources like nuts, seeds, and green leafy vegetables is paramount, supplementation may be warranted in clinically significant deficiency.

For physicians, integrating magnesium status assessment into the diagnostic workup for musculoskeletal complaints can offer valuable insights. This abstract advocates for a proactive approach to recognizing and addressing magnesium deficiency in clinical settings, emphasizing its potential to mitigate disease progression and improve patient outcomes. Enhanced understanding and application of magnesium's role in musculoskeletal health can significantly influence therapeutic success.

MTE11

AI FOR PATIENT MANAGEMENT: TRANSFORMING HEALTHCARE DELIVERY?

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Artificial Intelligence (AI) is ushering in a paradigm shift across the clinical spectrum, redefining approaches to drug discovery, administrative efficiency, computer vision, and risk stratification. In healthcare, the integration of machine learning algorithms and deep learning models has been particularly impactful, underpinning Clinical Decision Support Systems (CDSSs) and advancing diagnostic precision, such as the enhanced detection of pulmonary nodules on chest Computed Tomography (CT) scans.

In day-to-day clinical practice, AI-driven tools capable of ambiently recording consultations and automating labour-intensive administrative tasks—such as clinical note-taking and correspondence generation—are rapidly gaining adoption. These innovations have the potential to alleviate the administrative burden on clinicians, thereby enabling a greater focus on direct patient care. However, it remains imperative to rigorously evaluate whether these theoretical efficiencies translate into tangible improvements in patient outcomes in real-world settings.

In the field of osteoporosis, among the most developed tools are those leveraging computer vision for opportunistic screening

and diagnosis. In particular, automated measurement of bone mineral density (BMD) and incidental vertebral fractures on routine imaging represents a potential advance in screening and secondary fracture prevention.

This "Meet the Expert" session will provide a comprehensive overview of the latest developments in clinical AI, with a distinct focus on its application to bone health. Emphasis will be placed on tools that directly influence patient management, examining their integration into the clinical workflow and their impact along the patient journey. Attendees will gain a nuanced understanding of the potential benefits and risks of these novel technologies.

MTE12

OSTEOARTHRITIS: A BONE OR A JOINT DISORDER?

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Osteoporosis (OP) and osteoarthritis (OA) are two common conditions associated with aging, also more frequent in women. They share some risk factors, including sex, age, inflammation and genetics. Other risk factors seem to have opposite effects in the two conditions, such as BMI, BMD and mechanical loading. Reasoning based on the role of these risk factors, however, may be a superficial approach in some cases because the different phenotypes of OA involve various biological pathways.

Specifically, the changes in subchondral bone during the evolution of OA suggest common pathophysiologic mechanisms. Both OP and OA have a strong genetic polygenic background, but without evidence of common genetic heritability. Local and systemic inflammation are risk factors for both OP and OA. High BMI is a risk factor for OA, but the relationship between BMI and OA differs across joints. Similarly, higher BMI is somewhat protective for hip fracture but increases the risk of humerus and ankle fracture. Lower BMI is a risk factor for hip fracture but may be protective for OA.

The link between bone mineral density (BMD) and OA is controversial, because of the confounding effect of osteophytes and of the interaction between BMI and BMD. Strong relationships have been observed for osteophytes, enthesophytes and high bone mass phenotypes, suggesting subsets of OA patients with increased bone formation. Despite generally higher BMD in OA, the risk of fracture is increased in OA patients, perhaps mediated by a greater propensity to fall and impaired mobility of vertebral bodies.

Women are more commonly affected by OP and OA. Estrogen deficiency has been involved in both increased bone resorption and cartilage degradation. Estrogen replacement tends to protect from both phenomena.

In summary, OP and OA may share common biological mechanisms. The link between BMD, BMI and fracture risk in OA is dependent on the stage, definition and location of OA and the way BMD is measured. Parallel biologic phenomena, however, do not necesseraly imply a unified mechanistic framework.

WCO IOF-ESCEO

2025 ROME

WORLD CONGRESS ON OSTEOPOROSIS, OSTEOARTHRITIS AND MUSCULOSKELETAL DISEASES

Abstract Book

Committee of Scientific Advisors Abstracts

CSA-OC1

BARRIERS AND SOLUTIONS FOR GLOBAL ACCESS TO OSTEOPOROSIS MANAGEMENT

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A key advance in the field of osteoporosis was the development of the conceptual and densitometric definitions of osteoporosis by the World Health Organization, cementing the role of dual-energy x-ray absorptiometry in bone health management. It has provided a platform for drug development, a means of characterising fracture sites as osteoporotic and a standardised methodology to describe its epidemiology worldwide. However, whilst low bone mineral density is a strong risk factor for fracture, many individuals who do fracture have normal or only modestly reduced bone mineral density. Furthermore, the same T-score has a different clinical significance depending on age and geography. The field is therefore moving towards calculation of absolute fracture risk, most frequently using the FRAX® tool, which incorporates bone mineral density as a risk factor rather than an indication for treatment. Uptake of this new direction has been variable internationally, with many parts of the world, particularly low and middle-income countries, still predicating treatment on bone mineral density, despite poor availability of densitometry in many such settings. Whereas the densitometric definition should be maintained, this should not be confused with an intervention threshold. The presence of a fragility fracture apart, reimbursement criterion based on clinical risk factors and not solely dependent upon DXA BMD offers a solution, perhaps best termed "high fracture risk syndrome".

CSA-OC2

APPROACHES TO RISK BASED POPULATION SCREENING: INSIGHTS FROM THE ROSE STUDY AND FREM DEVELOPMENT IN DENMARK

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Objective: This presentation aims to provide an update on the latest developments in population screening, focusing on case-finding and automated fracture risk prediction. Drawing from Danish experiences, it highlights the strengths and limitations of the ROSE screening program and the FREM model.

Material and Methods: The presentation outlines different population screening approaches for osteoporosis, including the potential use of machine learning (ML) for automated fracture risk prediction. Two Danish approaches will be discussed *Self-reporting of risk profile*: The ROSE study included approximately 35,000 women aged 65–80 years in a ten-year follow-up of the ROSE randomized screening trial. The trial evaluated the effectiveness of a screening program utilizing FRAX to identify women for DXA, guiding standard osteoporosis treatment. *Automated assessment of risk profile*: The FREM model applies ML to predict one-year risk of major osteoporotic fractures in the Danish population aged ≥45 years. The FREM_ML employs the multiple Additive Regression Tree (DART) boosting algorithm, trained and validated on registry data from 2,472,912 individuals without prior osteoporosis diagnoses or related treatment.

Results: The ROSE program demonstrated positive outcomes for those who completed the full screening process but also revealed that many high-risk individuals did not participate. Consequently, self-administered questionnaires may not be efficient for systematic screening due to low and differential uptake which can negatively impact health equity. The FREM_ML, designed for potential automated implementation in general practice, offers a data-driven method for identifying individuals at high fracture risk. The open-source FREM_ML boosting model, combined with explainable AI, has the potential to serve as an effective decision-support tool for physicians, aiding in referrals for DXA scanning. Data-driven approaches could enhance the screening process, making it more efficient and cost-effective.

Conclusion: Population-based risk screening has advantages and limitations. Automated, data- driven approaches, as shown by FREM_ML could be a way forward. The Danish experience highlights their potential in early screening and prevention. The FREM_ML decision-support system, integrating age- and sex-based DXA thresholds, may aid in early osteoporosis detection and fracture prevention. This underscores the feasibility of incorporating automated models into opportunistic screening programs in general practice, improving accessibility and equity in osteoporosis screening.

CSA-OC3

THE FACT AND FICTION OF AI IN OSTEOPOROSIS

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Artificial Intelligence (AI) has gone from the stuff of science fiction to the forefront of technological, enterprise and media interest, but how does it play out in healthcare? In this talk we will fractionate the robust reality from the substantial hype.

Computer vision has long led the way in clinical AI and osteoporosis is no exception with significant developments in the ability of machine learning to opportunistically identify fractures and bone mineral density from routinely performed medical imaging. Large Language models are swiftly coming up behind and making inroads into the growing administrative burden stifling clinical staff.

All this, and more, will be explored in this CSA session.

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Abstract Book

Committee of National Societies Abstracts

OCs1 - P1524

TARGETING THE MUSCLE–BRAIN AXIS: THE RECIPROCAL RELATIONSHIP BETWEEN COGNITIVE IMPAIRMENT AND SARCOPENIA- DOES IT REPRESENT A NEW PARADIGM IN SARCOPENIA?

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Background: Cognitive impairment and sarcopenia are increasingly linked, with research showing that individuals experiencing muscle loss and weakness associated with sarcopenia are also more likely to exhibit cognitive decline, particularly in areas like processing speed and executive function; this connection suggests a potential shared underlying mechanism between muscle health and brain function, although the exact pathways are still being investigated. This work was carried out by the Egyptian Academy of Bone and Muscle health in collaboration with the Food Bank Egypt.

Objective: To evaluate the bidirectional association between sarcopenia and cognitive impairment in a community based assessment.

Methods: This was a cross-sectional study carried out to assess sarcopenia and cognitive function amongst adults (over 50-years old) and older adults (176-subjects, 115 females and 61 males) living at care homes in Egypt. Assessment for risk of sarcopenia in cognitive impaired patients was carried out using SARC-F questionnaire. To quantitatively assess for sarcopenia, every subject was evaluated for: 1. Muscle strength: this included: measurement of the Handgrip strength; 2. Dynamic strength tests: including chair stands or timed up-and-go tests as well as, 3. Muscle function: Gait speed: Measures walking speed over a 4-meter distance. Cognitive impairment assessment was carried out using the Mini-Mental State Examination (MMSE) tool. Falls risk assessment was assessed by using the Falls Risk Assessment Scale (FRAS). Statistical analysis was carried out to analyse the relationship between sarcopenia and cognitive impairment.

Results: There was significant association ($p< 0.01$) between sarcopenia measures and cognitive decline. 66% of the patients with cognitive impairment had high SARC-F score. Assessment of muscle strength in subjects with cognitive impairment revealed that the prevalence of weak hand grip was 86%, whereas assessment of dynamic strength tests revealed chair stand test was impaired in 81.4% and time-up-and-go was impaired in 53.5%. Similar significant association ($p< 0.01$) was reported on assessment of outcome of muscle function which revealed impaired gait speed in 95.3% in subjects with cognitive impairment. Patients with cognitive impairment were at high risk of falls with mean Falls risk score of 4.84 ± 0.6 ($P<0.5$) in comparison to subjects without cognitive impairment.

Conclusion: Sarcopenia is significantly associated with an increased risk of cognitive impairment. This raises the possible role for muscle-derived mediators (myokines) in mediating muscle–brain crosstalk and highlights the importance of promoting muscle health through exercise and nutrition as a potential strategy for preventing cognitive decline in older adults.

OCs2 - P1277

EVIDENCE-BASED JOINT STATEMENT POSITION OF PERIOPERATIVE BONE OPTIMIZATION IN THE ARTHROPLASTY CANDIDATE, FROM 7 NATIONAL SOCIETIES

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Background

The prevalence of arthroplasty is increasing. Nearly two thirds of patients undergoing elective arthroplasty procedures have low bone mineral density (LBMD), among those, only 32.8% were receiving treatment at the time of surgery. (1)

In recent years, evidence that defines osteoporosis as a risk factor for arthroplasty complications has emerged. However, it has not affected the perioperative osteoporosis treatment rate. (2) Bone quality is underestimated and undertreated prior to elective arthroplasty.(3)

Materials and methods

A group of 7 national societies (FEMECOT, AMMOM, ACOMM, SCCOT, SECOT, SEFRAOS, SEIOMM.) developed a joint statement position on the diagnosis of osteoporosis and perioperative bone optimization in candidates for arthroplasty. "Arthroplasty Bone Optimization"

A scoping review of the available literature was performed, followed by a systematic review and meta-analysis. Subsequently, a Delphi Modified method was used to gather the different positions.

Results and recommendations

Recommendation 1: Patients scheduled for elective arthroplasty

should undergo a bone health assessment (BHA).
Experts' concordance: 100%
This assessment should evaluate risk factors and clinical signs of osteoporosis and low bone quality. Additionally, a bone mineral density (BMD) DXA scan should be performed for those with one or more risk factors for osteoporosis, meeting ISCD or regional indications for DXA testing.
Recommendation 2: If poor bone quality is observed during surgery and a bone health assessment has not been conducted promptly, a complete BHA, including a DXA scan, is imperative.
Experts' concordance:71.4%
Recommendation 3: In the arthroplasty candidate, If LBMD or osteoporosis are noticed, bone loss related factors should be corrected, and appropriate treatment for osteoporosis should be started before or right after arthroplasty.
Experts' concordance: 90.5%
The use of Anti-resorptive and bone anabolic agents have been shown to reduce periprosthetic bone loss, complications and non-septic revision rates after joint arthroplasty
Recommendation 4: In arthroplasty candidates, the diagnosis of osteoporosis or low bone mineral density (LBMD) should not delay the surgery.
Position 5: Monitoring axial and periprosthetic bone mineral density through DXA protocols can help identify bone loss in central and periprosthetic areas in patients with risk factors or osteoporosis.
Experts' concordance: 83.3%
Conclusions
Perioperative bone optimization is an approach that should be considered in all patients who are candidates for arthroplasty. We encourage the orthopedic surgeon and multidisciplinary team to diagnose and treat the arthroplasty candidate's bone by screening for bone-loss-related factors, diagnosing osteoporosis, and starting treatment. Following these recommendations could lower PPBL, complications, and aseptic revision rates after arthroplasty.
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OCs3 - P1196

ACCURACY OF ARTIFICIAL INTELLIGENCE FOR VERTEBRAL FRACTURE ASSESSMENT BY DXA SCAN

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Background: Established osteoporosis patients with hip fractures often remain underdiagnosed for osteoporotic vertebral compression fractures (OVCFs). Our hospital's standard of care for assessing hip fracture patients and coexisting OVCFs involves bone mineral density evaluation using dual-energy X-ray absorptiometry (DXA) scans and Vertebral Fracture Assessment (VFA) tools. YOLOv8 (You Only Look Once version 8), a powerful and efficient object detection model, has the potential to detect occult vertebral collapses, graded by the Genant classification, aiding in the early identification of OVCFs.
Purpose: To design and validate a multi-stage deep learning system for the automated detection, localization, and classification of OVCFs from DXA scans and VFA tools in established osteoporotic patients.
Materials and Methods: Data from 548 hip fracture patients who presented to our hospital from January 2018 to September 2024 were collected. DXA scan and VFA images of 344 patients were retrospectively evaluated. Spine specialists marked and classified fractures according to the Genant classification (0, 1, 2, 3), considering the upper and lower endplates and the posterior wall. Radiological diagnosis confirmed these classifications. YOLOv8 was employed for vertebral fracture detection. VFA results were categorized into two precision groups: bounding box-based (B) and mask-based (M). Model performance was evaluated using recall, F1-score, mean average precision (mAP50), and mean average precision across IoU (Intersection over Union) values from 50% to 90% (mAP50-95).
Results: The mean age of the 548 patients (262 female, 286 male) was 79.82 years (SD 8.62 years). Among them, 138 had intertrochanteric fractures, 203 had femoral neck fractures, and 5 had multiple fractures. The DXA scan and VFA images of 344 patients were recruited (138 with intertrochanteric fractures and 203 with femoral neck fractures). Bounding Box-Based Metrics (B) composed of Precision: 0.6635 (66.35% of predictions were correct), Recall: 0.8803 (88.03% of fractures were detected), F1-Score: 0.7567 (average of Precision and Recall), mAP50: 0.9609 (excellent performance in detecting positions at an IoU of 50%), and mAP50-95: 0.6881 (lower accuracy at higher IoU thresholds). Additionally, Mask-Based Metrics (M) composed of Precision: 0.5827 (lower precision compared to bounding box-based metrics), Recall: 0.8399 (83.99% of collapsed areas were detected), F1-Score: 0.6880, mAP50: 0.8937 (good performance), and mAP50-95: 0.5245 (lower accuracy at higher IoU thresholds). The final image shows an overlap of 90% between G1 and 81% between G2.
Conclusion: The artificial intelligence model can accurately and

automatically detect and classify OVCFs in established osteoporotic patients using DXA scans and VFA tools, according to the Genant classification. While the bounding box-based metrics outperformed the mask-based metrics, both demonstrated strong potential for clinical applications.

OCs4 - P1579

GLP-1 RECEPTOR AGONISTS AND RISK OF BONE FRACTURES IN ELDERLY PEOPLE WITH TYPE 2 DIABETES

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Objective: To assess the risk of fractures associated with glucagon-like peptide 1 receptor agonists (GLP-1 RA) therapy compared to sodium-glucose cotransporter-2 inhibitors (SGLT-2i) or dipeptidyl peptidase-4 inhibitors (DPP-4i) therapy in elderly people with type 2 diabetes.
Methods: This nationwide, population-based, cohort study included individuals with type 2 diabetes, ≥ 65 years, who initiated GLP-1 RA therapy or one of the comparators during January 2018–October 2022. The primary outcome was the first incident of vertebral, hip, pelvic, humerus, forearm or rib fracture. Anthropometric and clinical characteristics of patients, including osteoporosis and risk factors for fractures, were extracted from the electronic database. People were followed until fracture, death, or March 2024. After adjusting for propensity score, hazard ratios (HRs) with 95% confidence interval (CI) were estimated using stepwise Cox models, and the Fine-Gray model for competing risks. Subgroup analyses by age, sex, ethnicity, BMI, and osteoporosis were performed.
Results: Among 45,222 people, 73.0±6.4 years, 50% female, 66.5% were 65-75 years and 31.3% ≥75 years. During a median follow up of 35.3 (interquartile range 24.7-48.0) months, 3,618 (8.0%) had an incident fracture. Among 11,061 new users of GLP-1 RA and 34,161 of the comparator drugs, the overall incidence of fractures was comparable between groups ((2.82 (95%CI 2.63-3.02) vs. 2.75 (95%CI 2.65-2.85)), p=0.53, respectively, per 100 person years. In multivariate analysis for osteoporotic fractures (adjusted for multiple risk factors), initiating GLP-1 RA was associated with a 12% increased risk for bone fractures compared to the control group (HR 1.12, 95%CI 1.03-1.23, p=0.006). Repeating the analysis for competing risks, along with conducting various subgroup and sensitivity analyses, yielded results consistent with those of the main analysis.
Conclusions: Initiation of GLP-1 RA therapy was associated with an increased risk of incident fractures compared to SGLT-2i and DPP-4i, among elderly individuals with type 2 diabetes.

OCs5 - P424

SARCOPENIA AND ELECTROCARDIOGRAPHIC MARKERS OF ARRHYTHMIA RISK IN OLDER ADULTS

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Background: Cardiac arrhythmias are prevalent among older adults and significantly increase morbidity and mortality. Sarcopenia, a progressive skeletal muscle disorder, is associated with systemic inflammation, oxidative stress, and structural remodeling, potentially affecting cardiac function. This study investigates the relationship between sarcopenia and electrocardiographic (ECG) parameters indicative of arrhythmia risk.
Methods: A cross-sectional retrospective study was conducted with 283 community-dwelling older adults (≥60 years) who underwent comprehensive geriatric assessments. Sarcopenia was diagnosed based on the EWGSOP2 criteria, incorporating handgrip strength (35 kg for male and 20 kg for female) and skeletal muscle mass index (SMMI) (SMM/BMI). ECG parameters, including QTc interval, P-wave dispersion, Tp-Tend interval, and fragmented QRS, were measured. Multivariate logistic regression was performed to analyze the association between sarcopenia and ECG abnormalities.
Results: Sarcopenia was identified in 35.7% of participants, who were older (mean age 75.9 ± 6.3 years, $p < 0.001$) compared to non-sarcopenic individuals. Fragmented QRS (17.0% vs. 8.2%, $p = 0.032$) and atrial fibrillation (6.9% vs. 1.6%, $p = 0.038$) were significantly more prevalent in sarcopenic patients. P-wave dispersion, which reflects atrial electrical heterogeneity and remodeling, a known predictor of atrial fibrillation, was higher in the sarcopenia group (51.95 ± 16.94 ms vs. 46.79 ± 16.66 ms, $p = 0.042$). Fragmented QRS, an indicator of heterogeneous ventricular depolarization often associated with myocardial fibrosis or scarring, was independently associated with sarcopenia (OR: 2.415, 95% CI: 1.051–5.547, $p = 0.038$) in multivariate analysis.
Conclusion: Sarcopenia is associated with significant alterations in ECG parameters indicative of arrhythmia risk, including fragmented QRS and P-wave dispersion. These findings suggest that sarcopenia may contribute to electrical remodeling and arrhythmogenesis. Further prospective studies are warranted to explore the causal pathways linking sarcopenia and arrhythmias.

OCs6 - P1298

AN ARTIFICIAL INTELLIGENCE ALGORITHM TO IMPROVE DIAGNOSIS OF VERTEBRAL FRACTURES EMBEDDED IN FRACTURE LIAISON SERVICES CAN REDUCE FRACTURES AND REDUCE COSTS

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Objective

To estimate the patient benefit and economic impact of integrating an artificial intelligence (AI)-enabled vertebral fracture (VF) identification algorithm into optimally-run FLSs.

Material and Methods

The Nanox-AI HealthVCF algorithm was implemented into the radiology workstream of three UK NHS hospitals. The AI analysed existing CT scans and flagged those with potential moderate/severe fractures for local clinical confirmation. Patients with confirmed scans were referred to the local FLS for further assessment and management. Using a microsimulation model[1], the impact of the AI on patient outcomes and health and social care costs was estimated for 1,000 male and 1,000 female patients with confirmed VF over five years. We used observed FLS performance metrics before and after AI implementation from the FLS-Database of England and Wales and expert opinion from FLS leads to populate the model comparing results under pre-AI observed FLS to AI optimised-FLS settings.

Results

Subsequent hip, spine or other major osteoporotic fractures were 6.8% and 4.4% lower under the AI + optimised FLS setting for female and male simulated patients, leading to 44 and 59 quality-adjusted life years gained, respectively. Less subsequent fractures led to lower health and social care resource use: AI + optimised FLS would save 378 bed days per 1,000 female patients and 206 per 1,000 male patients, with reduced need for long-term institutional care after a fracture by 17 and 12 fewer years of long-term institutional care, respectively. FLS costs including medication would be higher under the AI + optimised FLS but these would be offset, partially for males and entirely for females, by savings in health and social care leading to extra costs of £62 per male patient and savings of £117 per female patient over the five years. The difference was driven by higher risk of hip after VF for women compared to men.

Conclusion

While VF are common and put patients at high imminent fracture risk, FLSs have struggled to identify this subgroup. Despite differences in age and higher mortality, adding AI to flag potential vertebral fractures can lead to substantial reductions in subsequent fractures and in health and social care costs. These findings support the widespread integration of AI into FLSs as both clinically and cost-effective.

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Disclosures

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OCs7 - P1401

HIGH-DOSE VITAMIN D THERAPY (300,000 IU MONTHLY): IMPLICATIONS FOR OSTEOARTHRITIS, OSTEOPOROSIS AND ARTERIAL STIFFNESS IN VITAMIN-D DEFICIENT PATIENTS

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Introduction:

Vitamin D deficiency is associated with skeletal disorders such as osteoarthritis (OA) and osteoporosis (OP), as well as non-skeletal conditions like arterial stiffness, a marker of cardiovascular health. The use of high-dose vitamin D therapy (300,000 IU monthly) has gained interest as an efficient means to correct deficiency and improve related health outcomes. In Osteoarthritis, high-dose regiemens may enhance anti-inflammatory effects. in Osteoporosis, clinical studies have shown improvements in lumbar spine and femoral neck BMD following high-dose vitamin D supplementation in deficient individuals. Vitamnin D may reduce arterial stiffness by modulating endothelial function, reducing vascular calcifications, improvement in pulse wave valve velocity and vascular compliance.

Material and Method:

The open prospective clinical study of 124 female patients suffering from Osteoarthrits and Osteoporosis, divided in a two groups by 62 each. The inclusion criteria was Vitamin D deficiency. Arterial stiffness was measured using Agedio device providing parameters from pulse wave velocity, central blood pressure, augmentation index, stroke volume etc. All. cardiovasular risk factors were included in a study and analysed accordingly. High-Dose Vitamin D Therapy (300,000 IU monthly) was applied intramuscularly and Vitamin D levels were measured one month later. Arterial stiffness was measured in all after one month accordinigly.

Results: The average age for Osteoarthritis group was 68,5 years and for Osteoporosis patients 66 years. The vascular age expressed as the value of arterial stiffness in Osteoarthritis group was app 5 years older than biological age. In Osteoporosis group this values wass 3 years difference. Vitamin D level in average was 16,7 ng/ml. After one month, following high dose Vitamin D application, the vitamin D level significantly increased to 24,5 ng/ml. Arterial stiffness was improved to 4 years in group I and to 3 years in group II respectively.

Conclusion: The high dose of vitamin D (300,000 monthly) is highly effective in a rapidly restoring adequate levels of 25-hydroxyvi-

tamin D, particularly in individuals with severe deficiency. This regime has shown efficiency in achieving appropriate serum levels within one month. This improvement had a postive effectiveness on arterial stiffness in osteoarthritis and osteoporosis patients.

OCs8 - P882

DESTRESSING MINDS. STRENGTHENING MUSCLES. YOGA AND ITS EFFECT ON MUSCLE STRENGTH IN HEALTHY INDIVIDUALS. A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Background: Muscle strength is crucially associated with BMD and falls risk. Yoga, an ancient practice that in general combines poses (asanas) and breathing exercises (pranayama), involves seated, standing, as well as supine postures that target most major muscle groups. Though its effects on balance, BMD and falls risk have been evaluated recently(1), studies exploring yoga's effects on muscle strength have not been systematically reviewed before. We evaluated randomized controlled trials (RCTs) comparing yoga's effects on hand grip strength (HGS) and lower limb strength (LLS) against no intervention controls (NIC) and active interventions (AC) such as Pilates, core stabilization exercises, and Taichi in healthy individuals.

Methods: We systematically searched scientific databases following a predefined protocol. Heterogenous data were qualitatively summarized. We conducted a meta-analysis of studies comparing yoga to NIC and AC, using standardized mean differences (SMDs) to pool outcomes.

Results: Twenty-five RCTs involving 1817 participants aged 6–90 years were analyzed. Yoga styles included Hatha, Ashtanga, Iyengar, Bikram etc. Yoga significantly improved HGS compared to NIC [SMD 0.50 (95% CI: 0.04–0.97); P=0.03; I²=77%]. A single study that compared yoga to AC reported positive HGS effects, with no between-group differences. Yoga also significantly enhanced LLS compared to NIC [SMD 1.51 (95% CI: 0.86–2.15); P<0.00001; I²=84%] and AC [SMD 0.44 (95% CI: 0.14–0.74); P=0.004; I²=8%]. Intervention lengths, and assessment methods showed significant heterogeneity.

Conclusion: Yoga significantly enhances HGS and LLS in healthy individuals compared to controls, with modest improvement in LLS and comparable benefits in HGS to AC. Future research should standardize protocols to better explore optimal yoga practices for muscle strengthening and their mechanisms.

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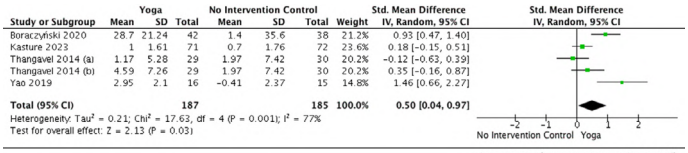

Figure 1a : HGS (Yoga vs No Intervention Control)

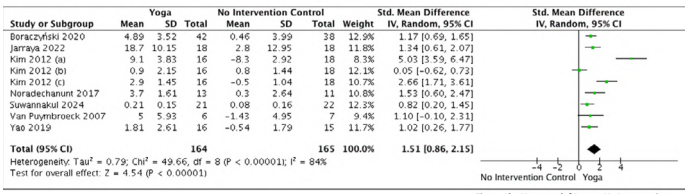

Figure 1b : LL strength (Yoga vs No Intervention Control)

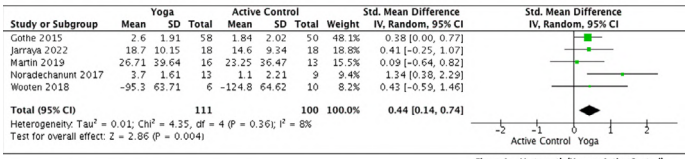

Figure 1c : LL strength (Yoga vs Active Control)

OCs9 - P968

HIGH-THROUGHPUT SEQUENCING OF BONE METABOLISM GENES AND THEIR ASSOCIATION WITH OSTEOPOROSIS RISK

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Objective: The study aims to investigate the association of genetic variants in bone metabolism-related genes with the risk of osteoporosis using high-throughput sequencing technology. By identifying key genetic contributors, the research seeks to enhance early diagnostic strategies and personalize preventive measures for individuals at high risk.

Material and Methods: The study cohort consisted of 456 individuals (recruited at 1st Minsk City Hospital, Belarus), including 251 with osteoporosis and 205 age- and sex-matched controls. DNA was extracted from peripheral blood, followed by targeted sequencing of 68 genes implicated in bone metabolism using the Illumina platform, generating an average coverage depth of 100×. Functional annotations of significant variants were obtained using ANNOVAR and *in silico* tools such as SIFT and PolyPhen-2.

Results: A total of 1,238 single nucleotide variants (SNVs) and small insertions/deletions were identified across the targeted genes. Statistical analysis revealed significant associations between osteoporosis risk and several genetic variants. In the *COL1A1* gene, the rs1800012 T allele was associated with a 1.8-fold increased risk (p = 0.002). The *VDR* rs731236 variant correlated with reduced BMD (p = 0.005). The rs9533156 G allele in

the *RANKL* gene was linked to elevated susceptibility (p = 0.01), while the *OPG* rs2073617 T allele exhibited a protective effect (p = 0.004). Additionally, the rs4754 A allele in the *SPP1* gene was associated with decreased BMD (p = 0.003), the rs2234693 C allele in the *ESR1* gene was linked to increased osteoporosis risk (p = 0.007), and the rs59983488 T allele in the *RUNX2* gene was associated with impaired bone formation (p = 0.002). Pathway enrichment analysis highlighted disruptions in Wnt/β-catenin signaling and osteoclast differentiation as key contributors to osteoporosis pathogenesis. Variants with predicted deleterious effects exhibited strong functional relevance in regulatory regions of the affected genes.

Conclusion: This study underscores the critical role of genetic variants in bone metabolism-related genes in modulating osteoporosis risk. These findings provide a foundation for the development of genetic screening tools and targeted interventions aimed at reducing osteoporosis-related morbidity and mortality.

OCs10 - P1056

SARCOPENIA AND BONE HEALTH PARAMETERS IN POSTMENOPAUSAL WOMEN WITH DIFFERENT TYPES OF OSTEOPOROTIC FRACTURES

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The research **aim** was to study sarcopenia and bone health parameters depending on the presence of various osteoporotic fractures in postmenopausal women.

Materials and Methods.

In the single-centre study, we examined 139 females aged 51-87 years (mean age 69.2±7.8 years), divided into three groups: 1 - healthy subjects without any previous fractures (n=50), 2 - patients with previous forearm fractures (FFs, n=39) and women with previous vertebral fractures (VFs, n=50).

Anthropometric measurements, including height, weight, and body mass index, were obtained using standard clinical methods. Muscle strength was evaluated using hand dynamometry and the "sit-to-stand" test. Muscle mass (appendicular muscle mass (ALM) and appendicular muscle mass index) was determined using dual-energy X-ray absorptiometry (DXA, Hologic). The diagnosis of sarcopenia was confirmed using EWGSOP2 criteria. Also, by DXA, we measured bone mineral density (BMD) in the lumbar spine (LS), femoral neck (FN), total hip (TH) and radius as well as trabecular bone score (TBS).

Results.

The examined did not differ in age, main anthropometric parameters (height, weight and body mass index) and menopausal status (menopause age and duration of postmenopausal period). However, the increased risk of confirmed sarcopenia was revealed in the patients with VFs (OR=2.71, 95% CI: 1.02-7.20; p = 0.045) but not in subjects with FFs (OR=0.60, 95% CI: 0.18-1.95; p=0.40). FN and TH BMD were significantly lower in patients with various osteoporotic fractures (FN BMD - group 1: 0.70±0.14; group 2: 0.63±0.10; group 3: 0.61±0.09 g/cm^2, respectively, F=9.96; p=0,00009) whereas LS BMD and TBS were reliable lower only in subjects with VFs (LS BMD - group 1: 0.89±0.19; group 2: 0.83±0.16; group 3: 0.80±0.14 g/cm^2, respectively. TBS - group 1: 1.23±0.10; group 2: 1.21±0.08; group 3: 1.17±0.10 un., respectively). We did find significant differences in radius BMD and ALM parameters depending on the presence and types of osteoporotic fractures. Also, we did not reveal reliable differences in muscle strength parameters between patients from the study groups.

Conclusion.

Patients with VFs have lower bone strength and quality, as well as an increased risk of sarcopenia compared to subjects without previous fractures, which should be counted in their management.

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Abstract Book

Non-Sponsored Symposia Abstracts

NSS1

APPROACH OF PHYSIATRISTS TO LOW BACK PAIN IN EUROPE, RESULTS OF A RESEARCH AND WHO GUIDELINE

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Background: Low back pain (LBP) is the most common type of musculoskeletal pain, thus it is one of the most commonly encountered conditions in Physical and Rehabilitation Medicine. According to WHO guideline; Chronic primary low back pain (CPLBP) is defined as; a persistent or recurrent pain experience of more than three months that is not reliably attributed to an underlying disease process or structural lesion. (2)
The physicians who are primarily responsible for the nonsurgical management of LBP are physiatrists.
Objective: Our present study aimed to investigate the approaches of physiatrists to low back pain across Europe. Preferences, tendencies, and priorities in the diagnosis, management, and treatment of LBP, as well as the epidemiological data pertaining to LBP in PRM practice were evaluated in this Europe-wide study. (1)
Methods: A cross-sectional descriptive survey study was undertaken to define the clinical approach of physiatrists for low back pain. An internet based-survey was prepared and distributed to physiatrists of the European countries by email. The responses were collected in an online survey site (SurveyMonkey®). A total of 576 physiatrists from most European countries participated in the survey.(1)
Results: The results show that physiatrists frequently deal with patients with LBP in their daily practice. Most patients are not referred to other departments and are treated with various conservative methods. Less than one-fifth of patients are primarily referred for surgery. The physiatrists believe that a clear diagnosis to account for cases of low back pain is rarely established. The most common diagnosis is discopathy. History and physical examination remain the most valuable clinical evaluation tools for low back pain according to physiatrists. Less than half the patients require a magnetic resonance imaging. Non-steroidal anti-inflammatory drugs are the most commonly prescribed drugs for low back pain. Exercise, back care information, and physical therapy are the preferred conservative treatments. More than half of the physiatrists offer interventional treatments to patients with low back pain.
Conclusion: Our present study is a preliminary report that presents the attitudes of European physiatrists in the management of low back pain. Further researches are warranted to standardize the conservative management of LBP.(1)
The WHO guideline addresses the following overarching question: "What are the health and well-being benefits and harms of non-surgical interventions in the management of chronic primary low back pain, with or without spine-related leg pain, in community-dwelling adults in primary or community care settings, including older people (60 years and older), compared with placebo, no intervention or usual care?"(2) In this presentation,the details of our research and the recommendations of WHO guideline for non-surgical management of chronic primary low back pain in adults in primary and community care settings will be presented and discussed in details.

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back pain in adults in primary and community care settings
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NSS2

UPDATE IN DIAGNOSIS AND MANAGEMENT OF LOW BACK PAIN

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Background LOW BACK PAIN (LBP) is the leading musculoskeletal contributor of disability worldwide, with increasing prevalence and inflicts a significant burden on the individuals affected, and limits mobility and activities, leading to early retirement from work and to reduced quality of life (1-3).

Aim

This update provides an evidence based overview of the important strategies in diagnosis and management of individuals with low back pain (LBP). With a good management of LBP the aim is to reduce borders for activities and participation in daily life caused by LBP and to improve the quality of life.

Methods

Reviews, meta-analysis, guidelines with the keywords low back pain, diagnosis, therapy, non-pharmacological and non-surgical approaches or management, rehabilitation were reviewed by PubMed-listed publications until January 10th 2025.

Results

In every stage of diagnosis and management of LBP it is important to plan and deliver a holistic and person-centered care (information and shared decision, support to understand the nature of LBP, managing expectations regarding pain and recovery, showing individual ways how to perform regular valued activities, with respect to the person´s needs, contexts, preferences, capacities and comorbidities), based on a biopsychosocial approach. (4)
For Diagnosis of LBP recommendations focus on standardized comprehensive clinical evaluations combining patient medical history including psychosocial factors, and physical examination,

but selective imaging only when red flags are present (e.g., suspected malignancy, fractures). In a first diagnosis stage it is important to look at red flags and rule out serious pathologies or identify specific causes of LBP. In 85–95% of cases, its specific etiology is not clear, and therefore, it is known as non-specific (NSLBP). Most of the episodes of NSLBP improve significantly in the first 6 weeks, although 6% and up to 40% seem to experience symptoms beyond 3 months, which is classified as chronic (CNSLBP). (5,6) Therefore risk factors for chronicity (yellow flags), psychosocial factors should be assessed already in the early acute state of LBP and if present to start early a multidisciplinary care.(7) The assessed restrictions in activities of daily life and the attention to psychosocial factors and comorbidities should guide us when selecting therapy and rehabilitation strategies.(7,8,9)

Following non-surgical Management strategies should be offered especially for chronic LBP as part of care in most contexts as Recommendations in favor (4):

Structured and standardized education/ advice, some physical therapies (exercise programmes, needeling therapies, manual therapy/ spinal manipulative therapy, massage), some psychological therapies (cognitive behavioural therapy, operant therapy), some medicines/ pharmacological therapies (first line non-steroidal anti-inflammatory drugs (NSAIDs, not to older people), topical Cayenne pepper [in other guidelines/reviews also muscle relaxants, but not topical Cayenne pepper]), Multi-component biopsychosocial care (that addresses at 2 or more factors that may influence a pain experience – physical, psychological, [and/] or social).

Recommendations against (4) as part of routine care in most contexts were some physical therapies (traction ultrasound, TENS, lumbar braces/belts), some medicines (opioid analgesics, antidepressants, anticonvulsants, skeletal muscle relaxants, glucocorticoids, injectable local anaesthetics, Devil´s claw, White willow), pharmacological weight loss.

Differences of guideline recommendations (4,7,8,9,10,11,12,13,14,15,16) for non-pharmacological and pharmacological therapies/ management strategies for LBP (focus to NSLBP) will be discussed within the presentation. As management approaches the following Non-Pharmacologic treatments (increasingly recommended over Pharmacological approaches) are partly recommended (without a single best evidence / recommendation for one of the non-pharmacological treatments): education for self-management, general-/ muscle strengthening-/ endurance-/ aerobic-/ aquatic exercise, mind body exercise (MBE) like Pilates/ Tai Chi/ Yoga, cognitive behavioral therapy, Mindfulness-based stress reduction, Multidisciplinary comprehensive biopsychosocial/ Multimodal care, occupational therapy, Massage, Heat wrap, Spinal manipulation, Acupuncture). For chronic LBP one may consider as pharmacological treatment antidepressants or anticonvulsants for neuropathic pain management.

Discussions and Conclusions

In every stage of diagnosis and management of LBP a person-centered approach should be sought. Within the diagnosis red flags (signs for serious pathologies or dangerous courses), yellow flags (risk factors for chronicity), the individual capacity for activities and participation, and comorbidities should be assessed. Selective imaging should be made only when red flags are present.

The aim in management of LBP is to support those affected by LBP for best possible performance in their daily life for valued activities based on the assessed individual factors with non-pharmacologic (e.g. education including self-management, exercise, MBE, cognitive behavioral therapy, Multidisciplinary biopsychosocial care) and pharmacologic (NSAIDs as first line) strategies, also in combination if necessary for return to their valued activities.

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NSS3

WHAT DO WE KNOW ABOUT PREFERENCES OF PATIENTS AT RISK FOR FRACTURES?

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Poor adherence to anti-osteoporosis treatments is a significant barrier to optimal disease management, partly due to a misalignment between treatment characteristics and patient preferences. This presentation will share findings from a recently published systematic review of 14 quantitative preference studies involving 4714 participants (Hintzpeter et al. The Patient 2024 Nov;17(6):619-634). These studies focused on the relative importance of various treatment attributes, with process-related attributes (50%) and outcome-related attributes (40%) being the most frequently studied. The review revealed that treatment efficacy was the most important factor for patients, outweighing considerations such as administration methods, cost, and side effects. Preference heterogeneity was observed in 86% of the studies, highlighting diverse patient priorities. These findings emphasize the need to incorporate patient preferences into osteoporosis treatment planning to improve adherence and clinical outcomes. By aligning treatment options with individual preferences, healthcare providers can foster more patient-centered care, leading to better outcomes for patients at risk of osteoporosis-related fractures.

NSS4

INTEGRATING PATIENTS PREFERENCES AND PERSPECTIVES INTO OSTEOPOROSIS CARE AND POLICY DEVELOPMENT: AN ACADEMIC PERSPECTIVE

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This presentation will explore four critical themes in integrating patient preferences and perspectives into osteoporosis care and policy development from a research-focused viewpoint. These themes include: 1) roles of patient preferences in decision-making, 2) empowering patients through shared decision-making, 3) leveraging patient-reported outcomes to elevate the patient voice, and 4) enhancing patient involvement in research and policy development. Through the presentation of scientific examples, we will discuss key lessons learned from research, offering practical insights on how patient preferences and perspectives can be meaningfully incorporated into clinical practice, research, and policy decisions. The goal is to provide the audience with actionable strategies and tools to enhance patient engagement in osteoporosis care and research, ensuring that patient experiences, preferences, and needs are authentically reflected in the decision-making process across all levels of healthcare and policy development.

NSS5

INTEGRATING PATIENT PREFERENCES AND PERSPECTIVES INTO OSTEOPOROSIS CARE AND POLICY DEVELOPMENT: THE PATIENT PERSPECTIVE

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This presentation will explore four key themes in integrating patient preferences and perspectives into osteoporosis care and policy development from the patient's point of view. These themes include: 1) roles of patient preferences in decision-making, 2) empowering patients through shared decision-making, 3) leveraging patient-reported outcomes to elevate the patient voice, and 4) enhancing patient involvement in research and policy development. Practical examples and lessons learned from patient engagement will be shared, equipping attendees with strategies to promote genuine patient involvement in shaping care and policy. The goal is to provide the audience with actionable strategies and tools to enhance patient engagement in osteoporosis care and research, ensuring that patient experiences, preferences, and needs are authentically reflected in the decision-making process across all levels of healthcare and policy development.

NSS6

A MESSAGE FROM THE BONE: HOW BONE-SECRETED FACTORS AFFECT MUSCLE GROWTH AND FUNCTION

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Bone-secreted factors play a significant role in regulating muscle growth and function, a relationship often referred to as "bone-muscle crosstalk." Bones secrete various signaling molecules, known as osteokines, as well as extracellular vesicles containing microRNAs, which influence muscle tissue in ways that are increasingly recognized as essential for musculoskeletal health. These bone-secreted factors include anabolic factors such as osteocalcin or Insulin-Like Growth Factor-1 (IGF-1) and catabolic or inhibitory factors such as Fibroblast Growth Factor 23 (FGF23), RANKL, or sclerostin. Bone diseases, such as osteoporosis, affect the profile and message of these factors by favouring the secretion of catabolic/inhibitory osteokines and microRNAs. This is considered one of the pathophysiological mechanisms of osteosarcopenia. This side of the bone-muscle interaction is critical for maintaining muscle mass and function throughout life. Therapies targeting specific bone-secreted factors, like osteocalcin supplementation, or RANKL and sclerostin inhibition, are under investigation for treating age-related muscle weakness and promoting overall musculoskeletal health.

NSS7

THE ROLE OF FAT IN MUSCLE/BONE CROSSTALK: AN ADDITIONAL COMPLEX PLAYER

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Fat tissue, particularly the fat found within and around muscles and bones, plays a significant role in the crosstalk between those two tissues, influencing both muscle and bone health. Fat cells secrete various signaling molecules called adipokines, which impact muscle and bone function, metabolism, and inflammation. Fat stored within muscles is increased in aging, obesity, and metabolic diseases. Excessive intermuscular adipose tissue (IMAT) is associated with reduced muscle strength and function, potentially due to infiltration of inflammatory cells, reduced muscle quality, and affects on muscle regeneration. High levels of marrow fat can negatively impact bone density and strength by competing with osteoblasts for stem cell precursors, reducing bone formation. Marrow fat cells also secrete pro-inflammatory cytokines, contributing to a local environment that favors bone loss and may impair bone-muscle communication. Systemically, excess adipose tissue, especially in obesity, leads to chronic low-grade inflammation through the release of inflammatory

cytokines like TNF-α and IL-6. In bone, this chronic inflammation can accelerate bone resorption (breakdown) and suppress bone formation, contributing to osteoporosis and increasing fracture risk and in muscle, inflammatory cytokines promote muscle catabolism, leading to muscle wasting and reduced function, a phenomenon seen in both aging and obesity. Fat quantification in muscle and bone could be used as a diagnostic tool for osteosarcopenia and a predictor of adverse outcomes associated with this condition. In addition, targeting adipokines, reducing intramuscular and marrow fat, and controlling inflammation are potential therapeutic strategies to improve bone and muscle health in conditions involving fat dysregulation.

NSS8

A MESSAGE FROM THE MUSCLE: HOW MUSCLE-SECRETED FACTORS AFFECT BONE METABOLISM AND FUNCTION

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Muscle tissue communicates with bone through various signaling molecules called myokines. These muscle-secreted factors influence bone metabolism, growth, and overall function. Irisin, which is released by muscles during exercise, promotes osteoblast activity, leading to increased bone formation. In contrast, myostatin is a negative regulator of muscle growth and, when overexpressed, can reduce muscle mass and lead to weaker bones. Inhibition of myostatin has been associated with increased bone formation, highlighting its role in the muscle-bone relationship. IGF-1 from muscle promotes bone formation and repair by stimulating osteoblast proliferation and differentiation. Higher levels of IGF-1 are linked to improved bone density and strength. IL-6 is released by muscles during exercise and has a complex role; in controlled amounts, it can stimulate bone formation. However, chronic high levels of IL-6 (often found in inflammation) can lead to bone resorption and osteoporosis. Overall, these muscle-derived factors, together with muscle-secreted microRNAs, are critical in maintaining bone health and preventing bone-related diseases. Exercise, which enhances the release of many beneficial myokines, is often recommended to strengthen both muscle and bone through this interconnected pathway.

NSS9

RISK FACTORS FOR VERTEBRAL FRACTURE

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Osteoporosis, a condition characterized by low bone mineral density (BMD), is a primary contributor to vertebral fragility. Studies indicate that individuals with osteoporosis have a significantly higher risk of sustaining vertebral fractures, even from minor falls or everyday activities. Vertebral fractures hereby represent a major health issue, particularly among the aging population, leading to significant morbidity, disability, and increased healthcare costs. Age is one of the most critical risk factors, with the incidence of vertebral fractures rising in individuals over 50 years. Postmenopausal women are particularly vulnerable due to the rapid decline in estrogen levels, which plays a crucial role in maintaining bone density. Gender differences also play a significant role, as women are more likely to experience vertebral fractures than men, primarily due to hormonal changes and differences in peak bone mass. However, men are not exempt, especially those with risk factors such as low testosterone levels or chronic diseases that affect bone health. Lifestyle factors are equally important in assessing fracture risk. Sedentary behavior, smoking, and excessive alcohol consumption, poor vision, balance issues, and unsafe living conditions can increase the likelihood of falls have been linked to decreased bone density and increased fracture susceptibility. Regular physical activity, particularly weight-bearing exercises, is essential for maintaining bone strength and reducing the risk of fractures. Comorbid conditions significantly influence the likelihood of vertebral fractures. Chronic diseases such as rheumatoid arthritis, diabetes, and chronic kidney disease can lead to bone loss and increase fracture risk. Additionally, certain medications, particularly long-term use of corticosteroids, have been shown to adversely affect bone health, further elevating the risk of vertebral fractures. The lecture aims to provide a comprehensive overview of the multifactorial risk factors associated with vertebral fractures, emphasizing the need for early identification and intervention.

NSS10

GERMAN GUIDELINE FOR THE DIAGNOSIS AND TREATMENT OF OSTEOPOROTIC THORACOLUMBAR VERTEBRAL FRACTURES

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Osteoporosis is currently one of the most common diseases among the aging population. One of its most significant clinical consequences is the occurrence of various bone fractures, with vertebral compression fractures being particularly noteworthy. Every year, up to 400,000 such vertebral fractures are diagnosed in Europe, particularly affecting elderly patients. Classifications for osteoporotic fractures have existed for over 50 years, but only a few have been widely adopted into clinical practice. The primary goal of any treatment for osteoporotic vertebral fractures is pain reduction and the rapid mobilization of patients. Conservative treatment can achieve reliable pain relief, early mobilization, prevention of additional fractures, and the preservation of quality of life. Surgical treatment is indicated only if these goals cannot be accomplished through conservative therapy alone.
In German-speaking regions, the OF classification is increasingly used for the classification of osteoporotic fractures. This

classification, developed through a validated consensus process by the Osteoporotic Fractures Working Group of the DGOU, consists of 5 subgroups (OF 1 to OF 5) and is based on conventional X-ray, MRI, and CT imaging. The new guidelines include 50 recommendations on diagnostics, conservative treatment (such as orthotics, pain management, and physical therapy), surgical interventions (vertebroplasty, kyphoplasty, ventral and dorsal instrumentation, implants, prophylactic cement augmentation, etc.), rehabilitation, complications, and follow-up.

NSS11

30 YEARS OF KYPHOPLASTY: A MILESTONE IN SPINE CARE IN OSTEOPOROSIS

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Kyphoplasty, a minimally invasive procedure designed to treat vertebral compression fractures, has transformed spine care over the past 30 years. First introduced in the early 1990s, it represented a significant breakthrough in addressing the debilitating effects of osteoporosis and spinal trauma, offering patients a chance to regain mobility and alleviate chronic pain.

The innovation began with the use of balloon-assisted bone augmentation, allowing the restoration of vertebral height and the stabilization of fractures using polymethylmethacrylate (PMMA) cement. Early adopters quickly recognized its potential to reduce pain, improve spinal alignment, and enhance the quality of life in patients who previously had limited options beyond conservative management or invasive surgery.

Over the decades, kyphoplasty has undergone significant advancements. Early techniques have been refined, making the procedure safer, more effective, and accessible to a broader range of patients. Innovations in imaging technology, such as real-time fluoroscopy, have improved procedural accuracy, while the development of biocompatible materials has reduced complications associated with cement leakage.

Clinical studies over the years have solidified kyphoplasty's role as a preferred treatment for osteoporotic fractures, particularly in elderly populations. Research has consistently demonstrated its ability to provide immediate pain relief and improved functional outcomes compared to non-surgical options. Additionally, the procedure has expanded to treat fractures caused by cancer metastases and traumatic injuries.

Today, kyphoplasty is a cornerstone of minimally invasive spine surgery, performed worldwide with excellent success rates. Its evolution over three decades is a testament to the intersection of innovation and clinical expertise, transforming the landscape of spine care. As we look to the future, ongoing research into materials and techniques promises to further enhance outcomes and expand the applications of this remarkable procedure. Kyphoplasty's journey is a true reflection of progress in modern medicine.

NSS12

UNDERLYING BONE HEALTH: IS IT IMPORTANT TO SURGICAL OUTCOMES?

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Compromised bone health, sarcopenia, and associated risk factors are prevalent in patients undergoing orthopaedic surgical procedures. Failure to recognize these factors pre-operatively can lead intra- and post-operative complications affecting overall outcomes. Related complications or failures secondary to compromised bone health are associated with increased health care costs, prolonged or repeated surgeries and/or hospitalizations, decrease in patient function, and an overall increase in patient morbidity and mortality.

NSS13

ORTHOPAEDIC SURGERIES AFFECTED BY COMPROMISED BONE HEALTH

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Bone health, sarcopenia, and associated risk factors significantly impact the outcomes of various orthopedic surgeries. Unfortunately, many patients' lack of bone integrity is often unrecognized in the pre-operative period, leading to compromised surgical results. Joint replacement surgeries are highly affected as poor bone quality increases the risk of implant loosening or failure. Spinal surgeries, including spinal fusion and vertebroplasty, rely on strong bone to achieve proper fusion and stability. Fracture repair procedures often face challenges in osteoporotic or brittle bones, where screws and plates may not hold effectively. Procedures like rotator cuff repairs and ligament reconstructions involving bone anchors and other methods of fixation are less secure in compromised bone. Ultimately, bone integrity is a determining factor in the durability and success of many orthopedic procedures and must be accurately assessed prior to surgical intervention.

NSS14

DEVELOPMENT OF PRE- AND POST-OPERATIVE BONE HEALTH PROGRAMS FOR ORTHOPEDIC SURGICAL PATIENTS

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Early recognition and treatment of pre-operative compromised bone health is paramount for the optimization of orthopaedic surgical outcomes. Unfortunately, recognition of compromised bone health in some patients is not realized until the intra- or post-operative period. Utilizing our individualized 4-Pillar Assessment,

we will provide practitioners with the necessary tools to perform a comprehensive bone health assessment and examination. From this information Health Care Professionals can develop a Multidisciplinary Assessment Profile (MAP) and an Integrated Care Plan (ICP) for treatment.

NSS15

WHAT DID BASIC RESEARCH TELL US ?

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Hyponatremia is the most common electrolyte disorder among hospitalized patients, with a prevalence of about 30%, and the most frequent etiology is the syndrome of inappropriate antidiuresis (SIAD). Interestingly, an association between mild, chronic hyponatremia and bone loss and fractures has been reported. The mechanisms underlying bone alterations in hyponatremia have been investigated in vivo and in vitro. Experimental data obtained from a rat model of SIAD and from murine pre-osteoclast cell cultures demonstrated that low extracellular [Na^+] is associated with a reduced trabecular and cortical bone content and with increased osteoclastogenesis and bone resorptive activity. These findings are not surprising, if we consider that about 30 % of total body sodium resides in the bone and slightly less than half of it is exchangeable with the serum pool. Thus, it can be hypothesized that chronic sodium depletion might promote the mobilization of bone stores with consequent demineralization. The maintenance of bone homeostasis is based on the dynamic balance between matrix deposition and resorption. Matrix deposition is warranted by osteoblasts, which derive from mesenchymal stromal cells (MSCs). MSCs establish functional relationships with other bone marrow resident cells and contribute to the generation of a complex microenvironment that affects bone homeostasis. Noteworthy, it has been shown that in low extracellular [Na^+] human MSCs are preferentially committed to differentiate toward an adipogenic phenotype at the expense of osteogenesis. A similar shift has been demonstrated in osteoporosis due to different causes. Furthermore, the binding of vasopressin, which is involved in the etiopathogenesis of hyponatremia due to SIAD, to the vasopressin type 1a receptor increases the formation of bone-resorbing osteoclasts and at the same time inhibits osteoblastogenesis. Overall, the available data strongly support a role of low [Na^+] in promoting bone loss.

NSS16

HYPONATREMIA AND BONE DENSITY

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In the past decades, both preclinical and clinical studies as well as case reports have suggested a possible causal relationship between chronic hyponatremia (serum sodium<135 mmol/l) and bone loss. In humans, many studies investigated the possible relationship between hyponatremia and bone, using both bone mineral density (BMD) measured by dual-energy x-ray absorptiometry (DXA) and markers for osteoblasts' (serum P1NP, osteocalcin) and osteoclasts' (serum CTX, NTx-creatinine ratio) activation.

In 2009, analysis of data from NHANES III study showed increased odds for hip osteoporosis in hyponatremic adults[1]. These results were in line with those of a metanalysis from 2016, showing lower hip BMD in hyponatremic patients[2]. In 2016, a secondary analysis of the INSIGHT trial showed a significant decrease of bone resorption index (urine NTx-creatinine ratio divided by serum osteocalcin) in the tolvaptan group[3]. In 2019, a case report showed a normalized DXA in a patient with 11 years valproic acid induced hyponatremia after discontinuation of valproic acid and resolution of hyponatremia[4]. More recently, our group performed two secondary analyses in patients with the syndrome of inappropriate antidiuresis (SIAD) showing that hyponatremia normalization increases bone formation index (the ratio between P1NP and CTX), primarily positively affecting P1NP[5,6]. Moreover, another analysis of data from NHANES in 2024 showed that mild hyponatremia is associated with loss of bone mass at the hip measured by DXA, but not with relevant changes in trabecular bone score[7]. These findings show a relevant interaction between hyponatremia and bone density, suggesting hyponatremia correction to mitigate bone-related complications.

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NSS17

HYPONATREMIA, FALLS AND FRACTURES

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Objectives: The key objectives of this review are to summarise the evidence to date about the association of hyponatremia with falls and fractures, exploring the related pathophysiological mechanisms, and to suggest a practical approach in day-to-day care in order to improve patient outcomes.

Materials and Methods: We conducted an extensive PubMed search until October January 2025 with the combination of the following keywords: 'hyponatremia' or 'sodium' or 'SIADH' and 'falls' or 'fractures' or 'bone', as MeSH Terms.

Results: Review of numerous observational studies confirms a significant independent association of, even mild, hyponatremia with two- to three-fold increase in the occurrence of bone fractures. Hyponatremia is a risk factor for osteoporosis with a predilection to affect the hip, while the magnitude of association

depends on the severity and chronicity of hyponatremia. Chronic hyponatremia increases the risk for falls by inducing gait instability and neurocognitive deficits. Besides the detrimental impact of hyponatremia on bone mineral density and risk of falls, it also induces changes in bone quality. Emerging evidence suggests that acute hyponatremia shifts bone turnover dynamics towards less bone formation, while hyponatremia correction increases bone formation.

Conclusions: The key unanswered question whether treatment of hyponatremia could lower fracture risk highlights the need for prospective studies, evaluating the impact of sodium normalization on bone metabolism, incidence of falls and occurrence of fractures. Recommendations for clinical approach should include measurement of serum sodium in all individuals with fracture or osteoporosis. Also, hyponatremia, as an independent risk factor for fracture, should be taken into consideration when estimating the likelihood for future fragility fracture and in clinical decision-making about pharmacological therapy of osteoporosis. Until it is proven that normalization of sodium can lower fracture occurrence, correcting hyponatremia cannot be universally recommended on this basis, but should be decided on a case-by-case basis.

NSS18

ADVANCING OSTEOARTHRITIS TRIALS AND THERAPEUTIC DEVELOPMENT THROUGH CLINICAL PHENOTYPING AND MOLECULAR ENDOTYPING

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Background: Osteoarthritis (OA) is the most prevalent form of arthritis and a leading cause of pain and mobility impairment worldwide. OA is a mechano-inflammatory joint disease characterized by progressive cartilage degradation, synovial inflammation, and structural changes in subchondral bone and other joint tissues. Emerging evidence reveals that OA is a heterogeneous and complex disease, encompassing diverse clinical phenotypes and distinct molecular endotypes (Mobasheri and Loeser, 2024). Clinical phenotypes refer to observable traits and patient characteristics, while molecular endotypes capture the underlying biological mechanisms and molecular signatures driving the disease. Despite this knowledge, conventional therapeutic approaches and most OA clinical trials have not sufficiently accounted for this variability, often resulting in suboptimal outcomes.

Objective: This presentation will synthesize evidence from recent biomarker-focused research to underscore the critical role of molecular endotyping in developing targeted disease-modifying osteoarthritis drugs (DMOADs).

Methods: A comprehensive review of the literature was undertaken, focusing on the identification of OA phenotypes and endotypes and their implications for therapeutic development.

Results: Variability in terminology notwithstanding, research from the recently completed Innovative Medicines Initiative IMI-APPROACH project (Angelini et al., 2022; Hannani et al., 2025) and ongoing programs such as ERA-NET Neuron GO-PAIN and the COST Action CA21110 (NetwOArk) has underscored the importance of molecular endotypes. These subtypes, defined by distinct molecular mechanisms, provide a framework for more precise molecular classification of OA. This enables the development of more effective, personalized therapeutic strategies (Hannani et al., 2024).

Conclusion: As evidenced by IMI-APPROACH and validated in OAI-FNIH, integrating biochemical markers, imaging data, and clinical features can uncover molecular endotypes with distinct therapeutic responses. Panels of biochemical markers show potential for identifying disease subgroups and enriching clinical trials with treatable endotypes. This molecular stratification enhances trial efficiency and therapeutic outcomes by selecting patient subsets most likely to benefit from specific treatments. Future research should prioritize multi-omics data integration to refine molecular endotyping approaches and evaluate their utility in clinical trial settings, advancing the development of targeted OA therapies.

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NSS19

ENDOTYPING OSTEOARTHRITIS BY INTEROGATING THE PATHOBIOLOGAL BIOACTIVITY PRESENT IN OSTEOARTHRITIC SYNOVIAL FLUID

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Objective:
Tools for identifying osteoarthritis patient endotypes are needed to develop targeted therapies and select the right patient for the right treatment. The biomolecular influence of OA-SF on cell signaling responses may provide cell-integrated information on the broader pathobiological status of joints and could provide a novel means to endotypes OA. The aim of this study was to develop a set of cell-based transcription factor activity reporter assays as explorative tools to endotype OA-SF.

Methods:
SW1353 Nano-luciferase transcription factor activity reporter cell lines were developed for NFκB, SRE, SRF, AP1, cAMP and SIE. These reporter assays were used to scree SFs of 160 end-stage knee OA patients. K-means clustering was used to identify OA-SF subgroups from the cell reporter data. The Pearson's r coefficient was determined for each reporter combination. RNAseq was performed on SW1353 cells stimulated with OA-SFs from subgroups. Multivariable regression analysis was performed to develop a reporter assay-based OA-SF scoring method.

Results:
K-means clustering of the OA-SF-induced reporter responses identified three OA-SF subgroups. To study the biological effects of the OA-SF subgroups, SW1353 cells were stimulated with OA-SF from the subgroups. RNAseq analyses on these samples demonstrated that two of the three OA-SF subgroups induced transcription of ribosome-related genes ("high-translation groups"). The other subgroup did not provoke this response ("low-translation group"). Correlation analysis showed that five reporters (NFκB, SRE, SRF, AP1 and CRE) correlated highly with each other (Pearson's r>0.75). SIE responses correlated poorly with the other reporter assays (-0.25<Pearson's r<0.25), indicating that the OA-SF-induced SIE cell signaling response is unique from the other tested reporters. Using multivariable regression, it was identified that the combination of AP1 and SIE responses separated the low-translation group from the high-translation groups almost as efficiently as the six reporters combined. Ongoing work is focusing on validating this scoring system using an independent cohort of OA-SFs.

Conclusion:
We identified two groups of OA-SF endotypes that differ in their capacity the induce transcription of ribosome-related genes, and which can be stratified using a combination of the SIE and AP1 cell reporter assays. This may provide a novel basis to separate OA endotypes.

NSS20

INSIGHTS INTO OA ENDOPHENOTYPES FROM RECENT CLINICAL TRIALS

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The OA field has struggled to find biomarkers reflective of underlying mechanistic pathways, that would define an endotype. New data from recent trials may provide insights into one pathway. Although interleukin-1 (IL-1) is known to play a role in OA pathogenesis, results from animal model studies have been mixed and clinical trials using anti-IL-1 therapies have failed to deliver convincing analgesic or structural benefits, despite some design limitations.

However a post hoc analysis of a large trial of the IL-1β inhibitor canakinumab, from the Canakinumab Anti-Inflammatory Thrombosis Outcomes Study (CANTOS) trial, has raised questions about who we should enrol in trials. In CANTOS, which was not an OA trial, over 10,000 patients who had previous myocardial infarction and elevated highly-sensitive CRP (hsCRP), were randomised to one of 3 doses of canakinumab or placebo subcutaneously every 3 months and treated for a mean of 3.7 years. The post hoc study demonstrated a marked reduction in total joint replacements (which can be assumed to be a surrogate measure of joint pain) in all active canakinumab arms compared to placebo. Similar results were seen in people who reported having OA at baseline. There was also a reduction in OA joint problems reported as adverse events. Another large cardiovascular-focussed trial explored the potential benefits of low-dose colchicine, which is an inflammasome (producer of IL-1) inhibitor; this also demonstrated a reduction in joint replacements. Various hypotheses can be drawn about what these studies are telling us, including selecting patients for inflammation biomarkers. A recent RCT treated knee OA patients with methotrexate and achieved its primary outcome of pain reduction at 6months. Sub analysis of that trial showed increased benefit in patients with elevated hsCRP. Perhaps we are getting closer to a biomarker for an inflammatory or metabolic phenotype.

NSS21

OBESITY SHAPES THE INFLAMMATORY MOLECULAR ENDOTYPES OF SYNOVIAL FIBROBLASTS IN OSTEOARTHRITIS

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Objective
Emerging perspectives suggest the heterogeneity of osteoarthritis (OA) is underpinned by distinct molecular endotypes[(1)], including

'low repair,' 'bone-cartilage,' 'metabolic,' and 'inflammatory' subtypes[2]. Among these, the inflammatory subtype has garnered significant interest due to its potential to exacerbate cartilage degeneration and promote joint pain[3] .

Research, including our own, has demonstrated that fibroblast-like synoviocytes (synovial fibroblasts; SFs) are central mediators of OA synovial inflammation, and how in hip OA patients with obesity, SFs adopt a more inflammatory phenotype[4].

Given obesity is a significant risk factor for OA development in both load-bearing and non-load bearing joints, we comprehensively profiled the phenotype of SFs across different joint sites in patients with normal-weight or obesity. Through this analysis, we sought to elucidate how obesity shapes the inflammatory molecular endotype of OA SFs, and to disentangle the metabolic effects and mechanical effects of obesity[5].

Materials and Methods

SFs from the synovium of n=32 OA patients with normal-weight or obesity (NRES:16/SS/0172) were characterised by proteomics (Olink, Luminex), metabolism (Seahorse) and RNA-sequencing. Immunohistochemistry was performed by Vectra.

Results

Our findings reveal that the phenotypic inflammatory landscape of OA SFs is influenced independently by obesity and anatomical site. Specifically, pathway analysis of single-cell RNA-seq data identified four distinct SF endotypes: (i) "activated" and (ii) "immune cell recruiters", which were both predominant in OA patients with obesity and characterised by elevated expression of inflammatory genes e.g., CXCL12 and Chemerin, (iii) "stressed/arresting", which were predominant in normal-weight, and (iv) "proliferative" fibroblasts. Spatial mapping showed that obesity-associated inflammatory SFs localised to both the synovial lining and sublining layers, distinguished by c-Fos expression. In contrast, normal-weight associated "stressed/arresting" SFs were confined to the lining layer and marked by c-Myc expression.

Conclusion

Our findings underscore the role of obesity in shaping the molecular landscape of OA by driving specific inflammatory endotypes, and provide further rationale for the therapeutic targeting of specific SF subtypes. Ultimately, building upon these insights and the foundational work from others in identifying distinct molecular endotypes may provide a critical line of sight between molecular target and patient, thus paving the way to stratifying patients for personalised therapeutic interventions and facilitating optimal clinical trial designs.

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NSS22

CLINICAL APPLICATION OF LONGITUDINALLY STABLE MOLECULAR ENDOTYPES IN OSTEOARTHRITIS: PATHWAYS TO PRECISION MEDICINE

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Heterogeneity of osteoarthritis (OA) is an obstacle to developing disease-modifying OA drugs (DMOADs) which historically have treated clinical trial populations with a one-size-fits-all approach. Recent efforts in biomarker research and molecular endotyping have taken us closer to personalized interventions by providing tools for improved patient stratification into druggable subgroups. Based on soluble biomarkers and machine learning, the IMI-APPROACH consortium established three endotypes of 1) structural damage, 2) low tissue turnover, and 3) inflammation.

One of the key aspects of endotypic stratification is whether individuals remain in their designated endotype over time, as a fluctuating endotype would impede its applicability in clinical trials. Longitudinal assessment of the biomarkers revealed an average endotype stability of 55% over 18 months. This stability was validated in the placebo group of the oral salmon calcitonin (SMC) phase III trials. The stability of the endotypes over time and recapitulation in a separate OA population highlights the utility of enriching for targeted subpopulations in clinical trials.

Clustering models are key to identify population-level endotypes, but their utility for clinical trial enrollment is limited. In this case predictive patient-level models are more suitable by providing real-time actionable endotype designations. Recently, we showed it is possible to predict endotypes with logistic regression models based on a panel of 6 biomarkers in the SMC trials where a reduction in WOMAC pain was demonstrated for the structural damage endotype.

Biomarker-informed endotyping allows more precise identification of tissue-relevant molecular drivers, enabling the transformation of OA from a phenotypically treated condition to a disease guided by mechanistic insights. Future studies will focus on linking longitudinally stable endotypes with patient-reported outcomes and treatment efficacy to improve the success of DMOAD trials.

NSS23

OSTEOPOROSIS AND ANCIENT HISTORY

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The World Health Organization (WHO) definition of osteoporosis describes it as a systemic skeletal disease characterized by low bone mass and micro-architectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility

to fracture risk. In these days, women and men lives longer and experience progressive bone loss and fractures, in addition changes in nutrition habits, modernity amenities have largely replaced the bone-loading activities that promote osteogenesis. Despite this, osteoporosis is not a disease only of the modern era. Paleopathology, the study of diseases in the past, using different sources focused on the pivotal papers from different geographic samples, suggests the disease was present at least five millennia ago. In this symposium, we will review how the evidence of bone loss and osteoporosis, in civilizations in the ancient age (the part of history that begins with the invention of writing and ends with the fall of the Roman Empire in 5th century). Also, we will discuss the difference between methods and studies, how it could apply the evidence and hypothesis about reproductive lifespan and nutrition were possible factors associated with reduced bone mass, to our modern osteoporosis practice.

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NSS24

OSTEOPOROSIS IN ART

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Osteoporosis like many other diseases has a representation in art. Although the clinical manifestation of osteoporosis is a fracture, its representation could be related to the disability related to the fracture or the loss of height which is displayed in many paintings that will be mentioned. The “arrival of the English ambassadors”, painted by Vittore Carpaccio, has been considered one of the best representations of osteoporosis. It shows an old lady that is portrayed in the lower hand corner of the art piece, which has been considered to be the governess of Ursula, the daughter of King Maurus of Venice. She is sitting on the steps of a staircase away from the rest. The consideration of osteoporosis comes from a trunk that is apparently shorter considering the length of her legs and a hump on her back. This painting is located at the Gallerie dellÁccademia, Venice. 1,4

The second piece was created by Spanish painter Francisco de Goya in 1799 and is known as “El Chitón” and represents two women close to each other and the women of the left is old and has a cane. According to the article by Curate, the characteristics that are related with the disease are a shorter truck compared to the length of the lower extremities, a humped back, the use of a cane and flexion of the knee. This art piece is located at the Museo Nacional del Prado in Madrid, Spain. 2,4

Although there are multiple paintings that represent those characteristics mentioned before the last painting that will be mentioned is the “Three ages of women” created by G. Klimt an austrian painter. The painting depicts three different stages of life one being a child, the second one a mother given that is holding the child figure and the one considered here and old women, that is the women on the left and you can see a hump on the back which represents the osteoporosis. This painting is currently at

the National Gallery of Modern Art in Rome, Italy. 3
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NSS25

HISTORY OF OSTEOPOROSIS PHARMACOLOGICAL TREATMENT

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Although osteoporosis has been known about for centuries, the potential for treating osteoporosis began ~80 years ago when Albright observed a relationship between estrogen deficiency and vertebral fractures. Modern studies using changes in bone mass and fracture incidence began in the 1970's demonstrating preservation of bone mineral density (BMD) and reduced vertebral fracture risk with estrogen, leading to its FDA approval in 1986 for preventing and later treating osteoporosis. Calcitonin was approved in 1984 based on prevention of total body calcium loss. After the BMD increase with fluoride was shown to be associated with increased fracture risk, FDA guidelines from 1994 required 3 year fracture endpoint studies in patients with osteoporosis for regulatory approval for osteoporosis treatment. Estrogen had not met that criterion, and approval for osteoporosis treatment was withdrawn. Based upon placebo-controlled trials with an average of ~2500 subjects in postmenopausal women at high risk of fracture, nasal calcitonin plus six new anti-remodeling or osteoanabolic drugs received approval between 1995 and 2003. The availability of these drugs, some of which were quite effective in reducing fracture risk, made it unethical to enroll very high risk patients in placebo-controlled studies. Subsequent studies enrolling lower risk patents with osteoporosis required much larger study populations (average 6700 subjects with concomitant expense) to achieve statistical power to demonstrate fracture risk reduction. An alternative is to use an active control arm, allowing enrollment of high risk subjects but also requiring large patient numbers. The expense of these large trials is a deterrent for drug development. Regulatory agencies are considering the strong evidence supporting the use of treatment-related changes in hip BMD as a surrogate for fracture risk reduction. If that strategy is approved, registration trials could be smaller, shorter and less costly.

NSS26

ASSESSING SEDENTARY BEHAVIOURS USING THE PATIENT REPORTED OUTCOME MEASURES (PROMS)

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Over the past two decades, there has been a notable shift in health systems towards a more patient-centered model of care. The Institute of Medicine has defined patient-centered care as "care that is respectful of and responsive to individual patient preferences, needs, and values". This paradigm shift has been fueled by a broad coalition of stakeholders, including clinicians, pharmaceutical companies, and regulatory agencies, who recognize the necessity of integrating patient-reported outcomes measures (PROMs) alongside traditional clinical biomarkers. This recognition has underscored the significance of considering not only clinical indicators but also the subjective experiences and perspectives of patients.
One potential application of PROMs is in assessing the self-perception of sedentary behaviors and physical activity levels. PROMS questionnaires focused on these behaviors can capture unique patient insights into their lifestyle patterns and activity levels, providing a valuable complement to traditional metrics. In this symposium lecture, we will explore the rationale for using such questionnaires, we will discuss why it is essential to capture patient-centered outcomes in this area, identify the range of available PROMs and patient-reported experience measures (PREMs), and provide guidance on their appropriate use in clinical and research settings.
Additionally, the lecture will cover the development and validation process for PROMs and PREMs, outlining key methodological steps, statistical considerations, and validation processes necessary to ensure that these tools accurately reflect the patient's voice. We will also examine best practices in the translation of PROMs for broader applicability across diverse patient populations, ensuring that these instruments remain culturally relevant and understandable. Through this scientific and educative presentation, attendees will gain a deeper understanding of how PROMs and PREMs can enhance patient-centered care and the broader implications of these tools for research and clinical practice in promoting better health outcomes and patient engagement.

NSS27

THE IMPACT OF SEDENTARY BEHAVIOUR ON PHYSICAL CAPACITY ACROSS LIFETIME

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With age, inter-individual variability in health or physiological status increases, suggesting that chronological aging cannot be considered as a good health biomarker. It has been proposed to measure biological aging since it may inform of the need for lifestyle interventions before aging acceleration leads to adverse clinical or public health events. Lifestyle behaviours (i.e., being physically activite or sedentary) have been identified as factors able to modulate biological aging. Indeed, investigations showed a strong relationship between being active and having good fitness throughout age. However, mixed results have been reported regarding the link between muscle power or muscle strength and the level of physical activity. It has been suggested that this inconsistency may be explained by the fact that some of these studies did not control for sedentary behaviour. The prevalence of sedentariness is increasing, constitutes a major public health issue, and may contribute to premature aging. However, the role of sedentary behaviour on muscle function remains misunderstood. For example, studies performed in middle-aged and older adults reported no associations between sedentary behaviour and handgrip strength but also mixed results regarding gait speed, lower-limb muscle strength or estimated lower-limb muscle power. Therefore, with the aging of the population and the decrease of healthy life expectancy, it appears important to better understand the impact of being inactive or sedentary behaviours alone on successful ageing but also their interrelationship with physical activity. To fill these gaps, the presentation will present new data showing the independent and interactive associations of sedentary and physically active behaviour on physical function and performance throughout age (20 to 92 years old). Overall, this presentation will show how adopting an active lifestyle but also reducing sedentary time should be considered as preventive measures against physical aging process.

NSS28

THE IMPACT OF SEDENTARY BEHAVIOUR VERSUS PHYSICAL ACTIVITY ON BONE HEALTH

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Bone health is strongly influenced by lifestyle choices, particularly the contrast between sedentary behaviour and physical activity. Sedentary behaviour, characterized by prolonged periods of inactivity such as sitting, is associated with an increased risk of bone-related health problems. Prolonged inactivity is associated with lower bone mineral density (BMD), compromised bone architecture and increased susceptibility to fractures. This relationship is of particular concern given the increasing prevalence of sedentary lifestyles in modern societies. Conversely, regular physical activity is widely recognized for its beneficial effects on skeletal health. Weight-bearing exercises, such as walking, running and resistance training, stimulate bone formation by placing mechanical stress on the skeleton, which in turn increases bone mass and strength. Physical activity not only prevents the decline of BMD, but also improves bone quality and supports structural integrity. For example, several studies have shown that resistance training has significant benefits for bone density in both younger and older adults. In addition, high-impact activities have been shown to be beneficial in slowing bone loss and maintaining bone mass, particularly in postmenopausal women who are at higher risk of osteoporosis. Research also points to the role of specific types of activity in reducing the risks of sedentary behaviour. Even low- to moderate-intensity activities, such as walking, contribute to bone health if performed regularly, suggesting that incorporating more exercise into daily routines can counteract the harmful effects of inactivity. In conclusion, promoting regular physical activity and reducing sedentary time are essential strategies for optimizing bone health. This dual approach could significantly reduce the incidence of osteoporosis and fractures, particularly in the ageing population.

NSS29

INTRODUCTION: ART, MUSIC, DANCING AND HEALTH

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Art has been a powerful form of expression. It speaks to our emotions and thoughts and has been a force that drives social change and creates awareness on relevant issues. Art making has been adopted as a health intervention in several disciplines. Our understanding of this concept is still limited but the 21st century has seen a growing interest in these concepts[1]. There is abundant literature on this topic and the World Health Organization has published a scoping review on it[2]. It is desirable that Health Professionals find ways to investigate and get involved on this topic and to engage patients in active and receptive participation in arts. This includes patients with osteoporosis[3].

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NSS30

DO PATIENTS BENEFIT FROM ARTISTIC ACTIVITIES? WHAT'S THE EVIDENCE?

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What is the relationship between engagement in creative arts and specific health outcomes? Growing evidence points to positive health effects of music engagement; forms of therapy based on visual arts; movement-based creative expression; expressive writing and other forms of art in reducing adverse physiological and psychological outcomes in several diseases. However, it remains largely unknown the actual extent to which these interventions enhance health status[1]. If we define health as the attainment of the highest level of physical, mental and social well-being, we understand the value of arts, as they may be instruments to help patients cope, to achieve their potentials, to be productive and active members of a community. Some methodological issues still limit our understanding of these issues, but it is easy to see how the traditional gap between art and science may be a fertile soil to set interdisciplinary partnerships and innovative forms of creative research. The notion that arts are "nice" but not necessary for health and wellbeing is being challenged and this change allows some glimpses of new attitudes towards a new role for art-based interventions[2,3]. Current views arise from evidences drawn from research on the effect of diverse art forms on some non-communicable diseases (Parkinson's disease, dementia, cancer, chronic pain, etc.), where diverse outcomes include neurobiological processes that may be conductive to scientific inquiry. Information on osteoporosis and art is still scant, but experiences from other conditions allow an optimistic view. Art making as a health intervention, understood as "a creative diversional and expressive process that allows an individual to create their own artwork to improve the individual's physical, cognitive, emotional and psychological health and/or wellbeing"[3], is subject to research, but existing evidence may lead us, Clinicians to include Arts in our daily practice.

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NSS31

ARTISTS AND ACTIVISM

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Art has been a powerful form of expression. Art speaks to our emotions, challenges and thoughts. Art has been a powerful force driving social change and creating awareness around pertinent issues. Art should not be submissive. Artistic and creative expression are part of the freedom of expression. The role of artists as creators of aesthetically beautiful products, has been also a vehicle for messages and interactions with audiences, and with this, frequently challenges societal norms and calls for change. Is asking an artist to produce a specific work to convey a health-specific message a limit to his or her freedom? Or is it a form of commitment with a desirable leading role? Commission of art may be a form to develop health specific messages. An open communication between the commissioner and the artist will maintain the integrity of the message within a free expression from the artist[1,2]. A few examples will be presented.

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NSS32

POTENTIAL MECHANISMS FOR TANGO AND BONE

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Tango, a beautiful and passionate dance, became a popular dance form around the world since its birth in 19th century in Argentina and Uruguay. Several possible health benefits have been adjudicated to Tango, including cardiovascular health, improved balance and coordination, mental health, weight loss and increased flexibility[1]. Several publications have focused on some of those benefits[2] and there is even a meta-analysis on its effect on Parkinson's disease[3]. Patients with osteoporosis, particularly those with fractures, show significant impacts on physical function[4]. Patients with osteoporosis commonly present some barriers to overcome those limitations, including fear of fracturing and lack of knowledge on key exercise components[5]. Although research is still limited, there are several possible positive impacts of tango dancing in those patients.

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NSS33

MULTIPLE SCLEROSIS. AN AUTOIMMUNE DISEASE

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Multiple sclerosis is a systemic autoimmune disease which results in demyelination of central nervous system neurons. The disease has a variable course and may run either a rather benign course or a progressive course leading to disability. Multiple sclerosis may be associated with osteoporosis which may lead to fractures. Multiple sclerosis is treated with immunomodulatory agents, including corticosteroids which may affect bone metabolism. In addition, the disease itself is an autoimmune disease. Autoimmune diseases are accompanied by the release of inflammatory cytokines which induce osteoclastogenesis, affect bone metabolism and may induce osteoporosis. Multiple sclerosis may be associated with vitamin D deficiency. Vitamin D deficiency may induce osteomalacia and secondary osteoporosis. Multiple sclerosis causes mobility limitation which may also affect bone metabolism and may induce muscular dysfunction which affects bone metabolism. Multiple sclerosis is also accompanied by dysautonomia or the dysregulation of the autonomic nervous system. Dysautonomia may cause osteoporosis via multiple mechanisms.

NSS34

OSTEOPOROSIS IN THE CONTEXT OF MULTIPLE SCLEROSIS

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Multiple sclerosis is accompanied by an increased risk of osteoporosis which may lead to fractures. Multiple sclerosis causes demyelination, inflammation and neuronal axonal damage which leads to disruption of neuronal function. Disrupted neuronal function causes muscle weakness, sensory function impairment and impairment of balance and vision. Multiple sclerosis leads to reduced bone mass and osteoporosis. It has been suggested that multiple sclerosis is a cause of secondary osteoporosis. Various factors lead to osteoporosis. Reduced physical activity and limited exposure to mechanical load of the bones contributes to osteoporosis. Vitamin D deficiency may also be implicated in the pathogenesis of osteoporosis in the context of multiple sclerosis. Vitamin D deficiency has been observed in multiple sclerosis and may be implicated in the disease pathogenesis. The use of immunomodulatory agents, corticosteroids in particular, may also be implicated in the pathogenesis of osteoporosis. Thus, osteoporosis is a characteristic of multiple sclerosis and may lead to fractures.

NSS35

TREATMENT OF OSTEOPOROSIS IN MULTIPLE SCLEROSIS

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Multiple sclerosis may be associated with osteoporosis and fractures. A scoring system has been developed for the assessment of the risk for the development of osteoporosis and fractures in multiple sclerosis patients, which takes into account traditional risk factors as well as the use of various drugs such as antidepressants and anticonvulsants as well as the history of falls. Osteoporosis is a multifactorial disease and should be treated by a multidimensional way including modification of the way of life, involving cessation of smoking and alcohol and augmentation of physical activity. All the medications applied in the treatment of osteoporosis may be used in patients with multiple sclerosis. Bisphosphonates, in particular alendronate in the effervescent form may be applied in the treatment of osteoporosis in multiple sclerosis. Denosumab may also be applied. However, when denosumab is withdrawn, alendronate should be used in order to stabilize bone mineral density. The use of calcium and vitamin D is also essential in the management of osteoporosis in the context of multiple sclerosis.

NSS36

FALLS AND PREVENTION IN MULTIPLE SCLEROSIS

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Multiple sclerosis may be accompanied by osteoporosis. A propensity to falls is also observed in patients with multiple sclerosis. Osteoporosis and falls may lead to fractures. Fractures may need surgical management and may further compromise patient mobility in multiple sclerosis. Dysautonomia, mobility limitations and impaired bone metabolism as well as the use of drugs for the treatment of multiple sclerosis may contribute

to falls. Falls may lead to fractures and further limitations in mobility completing a vicious cycle. Falls should be prevented in patients with multiple sclerosis. The use of physical therapy in the management of multiple sclerosis may improve balance and may contribute to the prevention of falls. The use of walking aids may also contribute to the prevention of falls in the context of multiple sclerosis. It should be kept in mind that multiple sclerosis is a chronic disease, which may lead to further deterioration of mobility and a professional team should be helping the patient to improve mobility, balance and prevent falls.

NSS37

THE IMPACT OF VERTEBRAL COMPRESSION FRACTURES (VCF'S)

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Osteoporosis (OP) is defined as a systemic disorder characterized by low bone mass and weakening of bone with increased risk of fracture, with approximately 27% of fragility fractures occurring at the spine. VCF's in acute or chronic stages, are a major cause of pain, morbidity and disability. Back pain, height loss, spinal deformity, hyperkyphosis, decreased physical and reduced pulmonary function, loss of mobility and quality of life may be the outcomes. Another very important aspect is that VCF's are highly predictive of future vertebral and other osteoporotic fractures. About 55% of hip fracture patients have experienced a previous VCF. Nearly half of VCF's are not detected clinically or by radiology. Thoracic hyperkyphosis and other changes of spinal alignment in cervical and lumbar spine, cause a definite propensity to falls. Posture changes are associated with decreased spinal extensor muscle strength, increased spinal loads, unstable gait, loss of balance and increased risk of falls. All of these changes, also with the contribution of osteosarcopenia and weakening of quadriceps muscle strength are possibly responsible for the following vertebral fracture cascade.

Early detection of a VCF is of great value and should be assessed in all patients to ensure that patients receive OP treatment on time. Treatment of pain and OP in the patient with acute VCF, combined with pain medication, bracing, education and planning for osteoporosis treatment is the essential approach. The work up of the VCF patient and start of osteoporosis medication if possible within a few weeks have to be organized. In subacute and chronic stages of VCF tailored stabilization, posture and strengthening exercises, braces and rehabilitation are important issues. Also augmentation in selected patients has to be considered. Evaluation of balance status and falls risk is another crucial aim in the prevention of fractures and following functional impairments. A close follow up of the patient with VCF is the main goal for secondary prevention of further fragility fractures.

NSS38

KEY REHABILITATION PRINCIPLES IN VERTEBRAL FRACTURES

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Vertebral fractures due to osteoporosis are becoming increasingly common as the global population ages. Most patients with osteoporotic vertebral fractures remain asymptomatic, highlighting the silent nature of the disease. However, once a vertebral compression fracture occurs, it creates a biomechanical environment that predisposes individuals to additional fractures, initiating the so-called "vertebral fracture cascade." This cascade contributes to progressive kyphotic angulation, impaired biomechanics, and an increased risk of falls, leading to a vicious cycle in osteoporotic patients. As such, managing the osteoporotic spine is a crucial component of osteoporosis care.

Rehabilitation plays a pivotal role in breaking this cycle by preserving spinal stability and improving muscle strength through tailored exercise programs. Effective rehabilitation goals include muscle re-education, resistance training for strength enhancement, proprioception improvement, bone mineral density optimization, pain relief, and reduction of kyphosis.

A comprehensive assessment of the spinal status is essential prior to initiating any rehabilitation program. This includes evaluating posture, kyphotic angle, acute or chronic vertebral fractures, and the presence of painful paravertebral muscle spasms. Strengthening the back extensor muscles is particularly critical, as these muscles are vital for spinal stability and alignment.

In cases of recent vertebral fractures, rehabilitation should begin cautiously, often with exercises in the sitting position, and progress gradually. Weight-bearing and loading exercises are generally more effective than endurance exercises for increasing bone density. Strengthening the axial musculature improves spinal mobility, reduces kyphosis, and decreases the risk of further vertebral fractures.

Non-weight-bearing activities such as swimming and cycling, while not directly improving bone density, are valuable components of the rehabilitation plan. These activities enhance neuromuscular coordination, balance, and overall physical function, thereby reducing the risk of falls and associated complications.

Rehabilitation for vertebral fractures must be personalized, taking into account the unique needs and physical condition of each patient. A well-structured and individualized approach is essential for optimal outcomes in managing vertebral fractures and improving quality of life in patients with osteoporosis.

NSS39

BRACING IN VERTEBRAL FRACTURES: MYTHS AND FACTS

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Vertebral compression fractures are the most common type of osteoporotic fragility fracture, which represents a major cause of morbidity and significant cost to the healthcare system. The management of acute vertebral compression fractures remains controversial. Differences in management strategies may arise from the fact that these injuries are managed by physicians from different specialities. In fact, variations in the use of braces are one of the most debateable issues in clinical practice. But there is no confusion that the pain control, early mobilization, and neurologic stability are the primary goals of the treatment.

Braces have been shown to reduce pain, but their effects on long-term functionality and fracture progression could not been demonstrated. Additionally, recent studies showed that there is no superiority between rigid and soft braces in terms of long-term pain or functionality. For females over 50 with thoracic and lumbar compression fractures, there is moderate quality evidence to support the use of rigid bracing for up to six months following injury. Considering both patient compliance and cost-effectiveness, soft braces appear to be a suitable option especially for pain control. Additionally, rigid bracing can precipitate skin breakdown, negatively impact pulmonary mechanisms, and increase caretaker burden. As such, an initial use of soft bracing for compression fractures may be a reasonable alternative to rigid orthosis. Regardless of the type of brace used, the likelihood of a severe failure resulting in neurological deficit is very low for patients with compression fractures. In fact, the evidence indicates that the primary advantage of bracing is a slight improvement in short-term pain management.

Following an acute vertebral compression fracture, more focus should be placed on osteoporosis assessment/ optimization and less on rigid bracing. This is particularly valid in cases where the patient is not previously diagnosed with osteoporosis. The presence of a single vertebral compression fracture increases the risk of subsequent fractures by fivefold and the risk of hip and other fractures by up to three folds.

NSS40

VERTEBRAL AUGMENTATION: WHO AND WHEN?

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The management of spinal injuries in osteoporotic patients focuses on achieving optimal clinical outcomes by ensuring spinal stability and, when necessary, optimizing neurological function. Effective treatment should mitigate the detrimental effects of injury, alleviate pain, enhance functional recovery and quality of life, and minimize associated morbidity.

In osteoporotic patients without neurological deficits, vertebral augmentation techniques such as indirect reduction with kyphoplasty, titanium vertebral body stents, or percutaneous cement-augmented pedicle screw fixation (with or without kyphoplasty or stenting) are commonly employed. In contrast, patients with neurological deficits require anterior decompression through mini-open or endoscopic approaches to address the compromised neural elements.

Comparative studies of kyphoplasty and titanium implants reveal similar biomechanical properties; however, kyphoplasty involves the use of significantly more cement. Titanium implants, on the other hand, better maintain anterior vertebral height, offering an advantage in preserving spinal alignment.

For thoracolumbar fractures without neurological deficits, particularly in flexion-distraction injuries or burst fractures with a flexion-distraction component, bone cement-augmented posterior percutaneous pedicle screw fixation combined with titanium vertebral body stents is recommended. Indications for vertebral augmentation include:

- Deficiency of anterior bone stock on CT
- Vertebral body height loss exceeding 30%
- Sagittal index between 15 and 25 degrees.

In the absence of these indications, percutaneous pedicle screw fixation alone can suffice, providing tension band stability.

In cases involving neurological deficits or when fractures progress to necrotic bone, mini-open anterior support and/ or decompression, as well as endoscopic decompression with instrumentation, are critical for effective management.

By carefully evaluating individual patient profiles and fracture characteristics, clinicians can determine the most appropriate timing and method of vertebral augmentation to ensure optimal outcomes in osteoporotic vertebral fractures.

NSS41

WHAT DO WE KNOW ABOUT OSTEOARTHRITIS: DOES IT TRANSLATE BETWEEN AFFECTED SPECIES?

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Objective: To edit a narrative review comparing the osteoarthritis (OA) phenotype observed in natural models of OA in cats and dogs, as well as in experimental models in rats when justified.

Material and Methods: Data extraction from the literature and a 30-year experience in studying OA in pets focused on comparing different aspects of the OA phenotype: 1) prevalence; 2) localization; 3) risk factors; 4) detection and diagnosis; 5) OA mechanisms from the joint to nervous system alterations.

Concurrent validation of experimental OA models was conducted when justified.
Results: Osteoarthritis is a degenerative joint disease that has long been recognized as a major cause of chronic pain in cats and dogs. In Western countries, its prevalence is approximately 25% in the adult population and can reach as high as 65-85% in older animals. It could be of primary (mostly in cats) or secondary (in dogs) origin, and risk factors include congenital joint malformations (such as dysplasia), post-traumatic issues, sterilization, size and weight, as well as environmental factors (obesity, excessive activity). It affects all appendicular joints (hip, stifle, hock and elbow) as well as the (lumbar) vertebral axis (cats). A trilogy of OA-associated pain is observed in pets, including biological (functional dysfunctions), psychological (behavioural changes, cognitive dysfunction) and social (changes in human-animal and animal-animal interactions) dimensions. Originally, the emphasis was placed on the biomechanical pain associated with cartilage degeneration and joint (articular) sclerosis. This perspective has evolved to incorporate structural remodelling, including neuroplasticity and peripheral and central sensitization. Chemical OA models in rats lack face validity, whereas the MI-RAT© model, which involves surgically-induced stifle instability and calibrated treadmill exercise, has been validated for spinal neuropeptidomics, neuroepigenetics, structural changes, and pain phenotype.
Conclusion: The translation of experimental animal pain to natural OA models is becoming increasingly appropriate for better characterization and proposal of effective clinical treatments of chronic pain.

NSS42

SOMATOSENSORIAL AND NEUROLOGICAL ALTERATIONS IN FELINE AND CANINE OSTEOARTHRITIS

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Objective: To evaluate whether sensitization is linked to deficits in stimulus transmission and integration or co-morbidities. The hypothesis proposed that hypersensitized individuals face a higher risk of nerve conduction damage, sensory changes, and cognitive decline.
Material and methods: Healthy (H) and osteoarthritic (OA) adult neutered cats (n=6 H, n=12 OA) and dogs (n=4 H, n=8 OA for nerve conduction) were assessed for peripheral (paw withdrawal threshold, PWT) and spinal (response to mechanical temporal summation, RMTS) sensitization, with lower values indicating higher levels of sensitization. Nerve conduction (motor and sensory) of the tibial and ulnar nerves was tested under standardized general anesthesia. Stimulus integration was recorded with somatosensorial (SEP), auditory (AEP) and visual (VEP) evoked potentials under dexmedetomidine sedation. Sensorial perception was evaluated for olfaction (binary behavioural response – repulsion to unpleasant odour) and audition (number of high-frequency sound repeated stimuli). Statistical analyses were based on data distribution (α=0.05).
Results: The OA cats or dogs experienced a decrease of more than 20% in their tibial and ulnar nerve amplitudes and velocities compared to H (P<0.05). The OA cats showed increased SEP and AEP latencies and amplitudes (P<0.036) but displayed lower VEP (P<0.046) results compared to H. The PWT was positively correlated with nerve conduction velocity (r>0.48, P<0.045) and VEP (ρ=0.747, P=0.004) results but negatively correlated with SEP (ρ=-0.428, P=0.037) and AEP (ρ=-0.800, P=0.003) latencies. The RMTS score was positively correlated with VEP latencies (ρ=0.589, P=0.042) and negatively with SEP latencies (ρ=-0.484, P=0.017), smell aversion (ρ=-0.653, P=0.026) and responses to auditory stimulation (ρ=-0.811, P=0.002).
Conclusion: Nerve conduction alterations were reported in individuals with OA. Hypersensitized cats were characterized by decreased nerve conduction amplitude and velocity, along with increased SEP and AEP latencies. These cats were more repulsed by unpleasant smells and less sensitive to repeated repulsive sounds. Chronic pain associated with OA is linked to alterations in nerve transmission, leading to changes in the perception of sensory stimuli. This raises concerns regarding the classification and therapeutic management of OA pain.

NSS43

EVIDENCE-BASED EFFICACY IN MANAGING OSTEOARTHRITIS IN COMPANION ANIMALS

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Objective: Conduct a scoping review on the pharmaceutical and non-pharmacological management of osteoarthritis (OA) in dogs and cats.
Material and Methods: Data were extracted from the literature, and a classification of therapeutic approaches was proposed based on their efficacy and the quality of the referenced studies. The quality of each study was evaluated through its experimental design, such as randomized, blinded, prospective, placebo-controlled, and the use of objective, validated pain assessments

(favoured over subjective non-validated scales) and their statistical analysis.

Results: Over the past 30 years, the efficacy of non-steroidal anti-inflammatory drugs (NSAID) for treating OA in dogs and cats has been documented in 40 and 15 publications, respectively. However, many of these studies have significant shortcomings that raise concerns about the reliability of their findings. For example, only 13 studies in dogs and 8 in cats used objective assessment measures such as podobarometric gait analysis or actimetry. The remaining studies relied on subjective evaluation scales that were only partially validated, if at all. Side effects were well-documented and continue to be a major concern with NSAID use, particularly in cats. Other analgesic treatments that have been explored include anti-NGF monoclonal antibody (mAb), tramadol, gabapentin, and the anti-viral drug amantadine. The two latter treatments provided limited evidence of efficacy, supported by only a few studies. While mAb gained immediate popularity, their indications for use remain unclear and comprehensive guidelines for their safe and efficient application (safety of drug combinations, emergence of subpopulations more sensitive to side effects) are lacking. Despite the publication of 25 articles regarding disease-modifying OA drugs (DMOAD) in dogs, none demonstrated compelling structural or analgesic efficacy. Caloric restriction and omega-3 polyunsaturated fatty acids (marine oil or green-lipped mussels) were identified as the most effective non-pharmacological therapies, with an impressive effect size of $d = 0.99$. Both joint injections of biologics and physiotherapeutic modalities showed limited evidence of effectiveness. No studies have specifically addressed sensitization as a treatment option, while other therapies offered only anecdotal evidence; however, sensorial enrichment appears promising.

Conclusion: Pets have a more extensive therapeutic arsenal than humans with OA, but it is still not perfect.

NSS44

GUIDELINES ADDRESSING IMMINENT RISK STRATEGIES

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Osteoporotic fractures increases fracture risk, disability and mortality. According to ASBMR/BHOF 2024, definition of imminent risk is a patient with a recent fracture or condition which translates into higher risk of subsequent fractures. On this scenario clinician shall consider different options available to in order decrease the risk of fractures.

Pharmacological interventions for imminent risk shall act quickly and reduce fracture risk as much as possible. Anabolic agents are the first choice. Starting treatment with anabolic is also ideal given that, when followed by antiresorptives, BMD increases continuously in opposite to what happens when anti-resorptives are used before osteoanabolics.

Osteoanabolic therapy have more probalitity of achieving higher targets. The Dutch guideline of osteoporosis and fracture prevention, published in 2024, does not consider imminent but high risk. It states that teriparatide should be given to postmenopausal women with a T score ≤ -1.5 in the femoral neck, total hip or lumbar spine and at least 2 grade 2 vertebral fractures or 1 grade 3 vertebral fracture and romosozumab should be considered with T score ≤ -2.5 in the femoral neck or total hip and at least 1 grade 2 or 3 vertebral fracture or a T Score ≤ -2 in the femoral neck or total hip and at least 2 grade 2 or 3 vertebral fractures.

The Endocrine Society guideline, published in 2020, does not use the term imminent risk but rather high and very high risk. The algorithm doesn't imposes anabolic-first approach but also recommends zoledronic acid and denosumab.

European guidelines for osteoporosis in postmenopausal women, published in 2019, also brings the definition of very high risk but does not go into details about antiresorptive or anabolic-first treatments.

This part of the session will address the guidelines that introducet the concept os very high and risk as well the recommended pharmachological options for each one of the guidelines.

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NSS45

TREATMENT DISCONTINUATION AND INTERMITTENT USE OF BISPHOSPHONATES

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Osteoporosis is a silent chronic disease characterized by reduced bone strength and increased risk of fracture. Since osteoporosis is a lifelong disease, attention to a prompt and long-term reducing fracture risk is necessary, so the beginning and the sequences of pharmacological treatment need to be accounted. As the guides encourage, start with osteoanabolic therapy is mandatory for patients with very high risk of fracture. After completing a course of therapy and once they have reached a treatment target, they should be switched to a high potent antiresorptive drug like denosumab (DMAB) for 5 to 10 years. In a future evaluation, when fracture risk is acceptable or no longer imminent or high risk for fractures, DMAB could be discontinued, but this is not an easy task. In this scenario, considering the pharmacodynamics of antiosteoporosis medications, two different regimens have been proposed, oral alendronate (ALN), starting 6 months after the last denosumab injection or zoledronic acid (ZOL) 9 months after the last DMAB injection.Once a patient reaches an acceptable fracture risk or treatment target, they can move from trying to achieve a higher BMD or reaching a lower fracture risk. This can be achieved with short, intermittent courses of an oral bisphosphonate such as ALN every two years or with infrequent doses of ZOL every 3 to 5 years. This last practice, known as intermittent therapy, promotes enhancement and consolidates the benefits achieved, especially in reduction of their fracture risk and maintenance of bone mineral density (BMD).

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NSS46

SEQUENTIAL AND COMBINATION THERAPIES MOSTLY SUPPORTED OR AVOIDED

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The sequencing of pharmacological interventions on osteoporosis is recommended irrespectively large clinical studies for fracture outcomes are scarce.

When considering therapeutic sequencing or combinations, it is important to evaluate wheter an ongoing intervention has been successful or not.

The occurrence of a fragility fracture or a significant BMD loss, during treatment, imposes major changes on the risk stratification. One example is the widely recommended introduction of an osteoanabolic medication after a fragility fracture for patients previously on resorptives like hormone replacememt therapy, bisphosphonates and denosumab.

The discontinuation of denosumab elicits to a rebound effect with higher bone resorption rates wich demands an immediate usage of potent anti-resorptive medications such as alendronate or zoledronic acid. Although the exact pathophysiology of this phenomenon is not clear, the detrimental effects of denosumab discontinuation should be avoided at all costs.

There is also evidence regarding the risk of transitioning from denosumab to teriparatide. On this switch, a rapid decline in spine BMD may occur at the hip and distal radius. Incremental changes on bone remodeling can be deleterious for skeletal health within the first six months.

Another potentially ominous situation is the simultaneous - or combined - use anti-resorptives like two different bisphosphonates and the combination of bisphosphonates with denosumab. There are serious concerns about a potential oversuppression of bone turnover leading to higher risk of atypical femur fractures and osteonecrosis of the jaw.

A similar strategy is recommended after osteoanabolic treatment cessation when an oral or intravenous bisphosphonates are recommended to the maintenance of teriparatide's benefits. On this case, denosumab showed higher BMD improvements than alendronate.

Other medication regimens widely recommended or avoided for osteoporosis treatmemt will be addressed in this part of the session.

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NSS47

BONE HEALTH IN PATIENTS WITH NON-METASTATIC PROSTATE CANCER ON ANDROGEN DEPRIVATION THERAPY (ADT) – AN OVERVIEW

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Androgen deprivation therapy (ADT) is the main treatment of patients with non-metastatic prostate cancer. Except for estrogen and androgen receptor inhibitors, ADT results in a drastic drop in testosterone level, to less than 5% of normal levels. Testosterone deficiency and therefore estrogen deficiency, sarcopenia, increased adiposity and insulin resistance, and concomitant glucocorticoid treatment, are all contributing factors that negatively affect bone health in patients with prostate cancer on ADT. The rate of bone loss on ADT is as high as 4-10% in years 1 and 2, and continues at a lower rate thereafter. ADT is associated with an increased relative risk of any fracture and of hip fracture by 20-70%, compared to controls.

Recent data derived from trials on androgen receptor inhibitors (apalutamide, enzalutamide, darolutamide) in patients with non-metastatic prostate cancer show an associated increased risk of falls and fractures. Further studies are needed to elucidate the mechanism of the musculo-skeletal impact of these agents.

NSS48

SUMMARY OF THE EVIDENCE ON BONE AGENTS IN PATIENTS WITH PROSTATE CANCER ON ADT

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We conducted a systematic review and meta-analysis of randomised controlled trials in men with non-metastatic prostate cancer on androgen deprivation therapy (ADT), receiving bisphosphonates (BP), denosumab (Dmab) or placebo/control. We identified 23 trials on BP (17 trials on zoledronic acid and 5 trials on oral BP), and 2 trials on Dmab. There was no reduction in fracture risk with oral or intravenous BP. One trial on Dmab showed a significant reduction in the risk of new morphometric fracture, diagnosed based on findings of T4-L4 radiographs, by 85% at 12 months and by 69% at 24 months.

Treatment with BP or Denosumab for 12 months increased bone mineral density at the hip by 1.5-3.8%, and at the lumbar spine by 4.0-6.8%, compared to placebo/control. The most reported adverse events were gastrointestinal side effects across all types of antiresorptives, followed by acute phase reactions, jaw osteonecrosis and hypocalcemia.

NSS49

RECOMMENDATIONS FOR THE MANAGEMENT OF PATIENTS WITH PROSTATE CANCER ON ADT

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Denosumab is FDA approved for fracture prevention in patients with prostate cancer on ADT. Oral and intravenous bisphosphonates were shown to prevent bone loss, while data on fracture is scarce. All patients with prostate cancer on ADT should have a baseline bone mineral density and fracture risk assessment using FRAX

The indications to start a bone active agent in this population include the presence of a previous fragility fracture at > 50 years, a T-score at the lumbar spine or at the hip ≤ −1.5, or a T-score between -1.5 and -1 in the presence of one or more risk factors (age >65 years, smoking, BMI <24 kg/m^2, family history of hip fracture and the use of oral glucocorticoids for > 6months), or a high FRAX above the intervention threshold for major osteoporotic fractures, according to each country's osteoporosis guidelines.

NSS50

LESSONS LEARNED FROM IMPLEMENTING AND MAINTAINING FLS IN SINGAPORE

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The implementation of Fracture Liaison Services (FLS) in Singapore underscores the critical importance of secondary fracture prevention in an aging population. Setting up the OPTIMAL secondary fracture prevention program at Singapore General Hospital in 2008 and running it albeit with many ups and downs over the last 17 years has been a fulfilling yet challenging journey. We initiated this program with the conviction that a Fracture Liaison Service (FLS) is essential for improving patient outcomes and reducing the burden of fragility fractures While the program has had immense success in identifying and assessing many patients with fragility fractures, sustaining its success has required constant innovation and collaboration.

A significant challenge is overworked manpower, with the team stretched thin between patient care and program operations. Frequent leadership transitions exacerbate this, as each new head of our collaborating departments requires reorientation to the program's goals. Misconceptions among healthcare providers—such as the belief that FLS can only succeed if osteoporosis medications are provided for free are a stumbling block, overshadowing the program's broader value which extends beyond pharmacotherapy to encompass patient identification, diagnostic workup, follow-up, and education.

Patient follow-up is another persistent issue. It is not feasible to keep stable patients on anti- osteoporosis medications in the hospital system. On the other hand, the issue of who will provide continuity of care if they are discharged to primary care remains a

challenge. To address this, we are collaborating with departments like Geriatrics and our polyclinics to develop clear discharge criteria and shared care protocols.
The lack of funding for osteoporosis medications and continued care in polyclinics due to block funding models adds another layer of complexity. This system covers fracture care but excludes key components of osteoporosis management, leaving gaps in care. We are advocating for policy changes, including expanding funding to cover medications, DXA scans, and follow-ups, and demonstrating the cost-effectiveness of integrated care through pilot studies and economic modeling.
We are also looking at innovative ways to enable early identification and assessment of patients with osteoporosis and fragility fractures. This includes LLM models to identify second fractures that occur in patients in between clinic visits and AI solutions that identify osteoporosis from radiological images performed for other reasons.
Despite the challenges, the program underscores the critical value of interdisciplinary collaboration, technology-driven solutions, and stakeholder engagement. The lessons learned reaffirm that secondary fracture prevention is not only a clinical necessity but a sustainable model of care. Our focus now is on scaling the program, embedding it into routine care, and ensuring that no patient at risk of secondary fractures is left behind. Simply put, FLS makes both clinical and health economic sense.

NSS51

LESSONS LEARNED FROM MENTORSHIP IN SWITZERLAND

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Fragility fractures are a major concern for public health in Switzerland representing 82,000 fragility fractures per year in 2019, with an expected increase of 37.5% of this number by 2024 with significant associated costs. Thanks to a mentoring program under the direction of the Swiss Association Against Osteoporosis (ASCO/SVGO), the implementation of FLS in Switzerland has increased significantly over the last 4 years, from 10 in 2020 to 22 FLS mapped on the Capture the Fracture Map of the Best Practice Framework. This mentorship program is essentially based on two major events per year which are organized for team members already involved in FLS or for those who wish to create a new FLS: an online coaching clinic in the spring delivered both in French and German to allow a better interaction of participants in their mother tongue and a face to face Swiss/ALPS FLS Network Meeting in autumn. Before this FLS Network Meeting, the champions of the FLS fill out a questionnaire on their activity during the previous year (and sometimes a poster), and thus the progression of the main key performances indicators can be shared between the FLS. In addition, the FLS are also asked to describe what were their major accomplishment and greatest challenge during the previous year. To encourage exchanges of experiences between the FLS team members during these events, workshops on different topics are addressed such as: Collaboration with GP's, FLS education material for GPs & patients; How to follow up patients (mail, phone, person…..); Identification of Previously Unrecognized Vertebral Fracture. The major objective of this mentorship program is to increase and consolidate the interactions of members of the Swiss FLS network to ensure the development of new FLS and improve the quality of existing ones.

NSS52

NAVIGATING CHALLENGES IN THE FIGHT FOR FRACTURE LIAISON SERVICES IN SOUTH AFRICA

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This abstract presents an overview of the Fracture Liaison Services (FLS) in South Africa and the role of the National Osteoporosis Foundation of South Africa (NOFSA) in the establishment and development of these services. It delves into the initiatives undertaken by NOFSA, the main challenges faced, moments of significant setbacks, and how we are trying to overcome these hurdles, culminating in valuable lessons still being learned!
Fracture Liaison Services are critical in managing patients with fractures, aiming to reduce subsequent fracture risk through comprehensive assessment and treatment plans. In South Africa, these services have proven essential but face numerous ongoing challenges due to resource constraints and awareness issues. NOFSA has been at the forefront, actively promoting FLS as a standard of care for fracture management. Though advocating for policy change, providing education, and fostering collaboration between healthcare providers is an ongoing struggle, NOFSA has spearheaded several initiatives to try and integrate FLS into the healthcare system.
One of the significant initiatives includes NOFSA's partnership with mostly private hospitals to establish pilot FLS programs, aiming to demonstrate the feasibility and benefits of structured fracture management. Despite these efforts, the journey has not been without challenges. Financial constraints, insufficient government and private Medical Aids support, as well as lack of public awareness have hindered widespread adoption. Specific obstacles have led to moments of defeat, such as the closure of some FLS programs and lack of funding, threatening the momentum of any progress made.
However, overcoming these challenges is possible through persistent advocacy, and international collaboration, especially from the IOF's Capture the Fracture (CTF) team. Learning from these experiences, NOFSA is trying to engage more stakeholders and leveraging data to highlight the cost-effectiveness of FLS. This data is however very sparse.
In conclusion, the case of FLS in South Africa underlines crucial lessons: the need for sustained advocacy, the effectiveness of collaborative networks, and the importance of data in driving funding and policy decisions. As the fight against osteoporosis and related fractures continues, these experiences provide crucial insights into developing sustainable healthcare interventions in resource-limited settings.

NSS53

THE GLOBAL BURDEN OF SARCOPENIA

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Sarcopenia, a progressive loss of skeletal muscle mass, strength, and function, primarily affects older adults and represents a significant public health concern globally. Although it has been recognized as a disease (ICD-10: M62.84), there is no universally accepted diagnostic criterion, leading to considerable variability in prevalence estimates and complicating efforts to quantify its global burden. Prevalence rates vary widely depending on the diagnostic criteria applied, ranging from 10% to 27% in individuals over 60 years and peaking at 86% in some population subsets using certain muscle mass-only measures. Severe sarcopenia prevalence is reported between 2% and 9%. Men are generally more affected than women, particularly under diagnostic frameworks like the European Working Group on Sarcopenia in Older People (EWGSOP2), though opposite trends are observed with criteria like the International Working Group on Sarcopenia (IWGS).

The etiology of sarcopenia is multifaceted, involving biological, hormonal, and lifestyle factors. Its onset often begins as early as the fourth decade of life, with an accelerated decline in muscle strength relative to mass, highlighting the critical role of strength-based diagnostics. Sarcopenia is strongly linked to adverse outcomes, including increased risk of falls, prolonged hospitalizations, functional dependence, and higher mortality rates. Economic implications are substantial; in the United States alone, sarcopenia-related healthcare costs reached $18.5 billion in 2000.

This global health challenge disproportionately affects regions with aging populations, with the highest prevalence observed in Oceania and South America, particularly under EWGSOP definitions. Risk factors such as undernutrition, comorbidities, and inactivity exacerbate its impact. Despite advancements in understanding sarcopenia, the lack of standardized diagnostic and assessment tools hinders effective global surveillance and intervention development.

To mitigate sarcopenia's burden, future efforts should prioritize harmonizing diagnostic criteria, adopting population-specific cutoffs, and implementing comprehensive public health strategies. These include early detection, promotion of resistance training, adequate protein intake, and addressing underlying health disparities. Recognizing sarcopenia as a critical determinant of healthy aging is essential to reduce its societal and economic impacts.

NSS54

MULTIMODAL EXERCISE AND NUTRITION: THE PILLARS OF SARCOPENIA TREATMENT

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Sarcopenia, characterized by progressive loss of skeletal muscle mass, strength, and function, is a significant challenge in aging populations. It contributes to increased fall risk, disability, and poor quality of life. Effective management requires a comprehensive approach emphasizing lifestyle modifications, particularly exercise and nutrition. This abstract synthesizes findings on multimodal strategies for treating sarcopenia, highlighting the synergistic role of physical activity and dietary interventions.

Resistance training (RT) is the cornerstone of sarcopenia management. It promotes muscle hypertrophy, enhances strength, and improves energy metabolism. Regular RT has been shown to counteract muscle atrophy even in chronic diseases and conditions associated with sarcopenia. While aerobic exercises primarily enhance energy metabolism, they also support physical function and cardiovascular and muscle endurance. A combination of RT and aerobic activities, often supplemented with balance and flexibility exercises, yields superior outcomes in muscle mass preservation and functional improvements.

Nutritional interventions complement exercise in sarcopenia management. Adequate protein intake, particularly leucine-rich sources, stimulates muscle protein synthesis. Supplements such as omega-3 fatty acids, vitamin D, and beta-hydroxy-beta-methylbutyrate (HMB) have shown promise in enhancing muscle mass and function. Emerging evidence also suggests that the gut-muscle axis, influenced by prebiotics and probiotics, may play a role in mitigating sarcopenia by modulating systemic inflammation and metabolic pathways.

For patients with frailty or other chronic conditions, personalized, multimodal approaches integrating tailored exercise regimens with nutritional optimization are crucial. This strategy not only addresses sarcopenia's multifactorial pathogenic mechanisms but also enhances overall health outcomes, functional independence, and quality of life. Ongoing research into the precise mechanisms of sarcopenia and its relationship with aging and chronic diseases underscores the importance of these pillars. While current findings advocate for combining exercise and dietary interventions, more high-quality trials are needed to refine guidelines for dose, intensity, and long-term adherence.

In conclusion, multimodal exercise and nutrition serve as the foundation for sarcopenia treatment, offering significant potential to mitigate its impact and improve the well-being of older adults. This integrated approach aligns with the principles of preventive and regenerative medicine, fostering resilience against aging-related muscular decline.

NSS55

DIGITAL TECHNOLOGIES IN SARCOPENIA TREATMENT: THE RIGHT THERAPY FOR THE RIGHT PATIENT

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Sarcopenia, a progressive loss of skeletal muscle mass, strength, and function, represents a growing concern in aging populations due to its association with decreased mobility, increased fall risk, and reduced quality of life. Despite advances in conventional treatments, delivering personalized and effective therapies remains a challenge. Emerging digital technologies—including artificial intelligence (AI), wearable devices, and mobile health platforms—are now revolutionizing sarcopenia management, offering innovative solutions for tailoring therapies to individual patient needs.

AI-powered tools such as smart insoles and pose estimation systems are paving the way for more precise diagnostics and interventions. By analyzing gait patterns and joint mechanics, these technologies facilitate the development of digital biomarkers, which can accurately classify and monitor sarcopenia progression. Smart insoles equipped with pressure sensors and inertial measurement units (IMUs) provide real-time feedback on movement and balance, while AI models process data to offer actionable insights. Pose estimation technology, using computer vision and deep learning algorithms, further enhances assessments by capturing detailed biomechanical data.

Wearable devices and mobile applications have also emerged as key enablers of remote rehabilitation and patient engagement. These tools support personalized exercise regimens designed to strengthen muscles, improve balance, and enhance overall physical function. For instance, telehealth platforms integrate wearable data to monitor adherence and provide real-time feedback, ensuring that patients perform exercises safely and effectively. Mobile apps featuring exercise demonstrations, reminders, and progress tracking enhance compliance and allow for adaptive adjustments based on individual performance.

Additionally, integrating nutritional and psychological interventions into digital platforms promotes a holistic approach to sarcopenia management. AI-driven dietary analysis tools and virtual coaching provide tailored nutritional guidance, while telepsychology services address the emotional and cognitive aspects of adherence to treatment.

This convergence of technology and healthcare underscores a shift toward patient-centered, data-driven care. By overcoming traditional barriers—such as accessibility, cost, and lack of personalization—digital health solutions enable scalable and efficient sarcopenia treatment. As research continues to refine these technologies, their integration into routine care has the potential to deliver the right therapy to the right patient at the right time, transforming outcomes for individuals affected by sarcopenia.

NSS56

BONE FRAGILITY AND OSTEOPOROSIS IN CHILDREN AND ADOLESCENTS: WHEN AND HOW TO DIAGNOSE IT?

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Although rare, osteoporosis in children and adolescents requires prompt diagnosis to enable timely treatment and prevent long-term complications.

The diagnosis of osteoporosis among pediatric patients is defined by the presence of a low bone mineral density, indicated by a Z-score≤ -2.0 standard deviations, in conjunction with a clinically significant fracture history, or the occurrence of low-energy vertebral fractures.

Secondary osteoporosis is the most frequent form in pediatric populations and arises from various underlying conditions. Common causes include chronic inflammatory diseases such as juvenile idiopathic arthritis, prolonged use of glucocorticoids, endocrine disorders like malabsorption syndromes, and nutritional deficiencies (e.g., calcium or vitamin D). Affected children and adolescents should undergo a thorough diagnostic workup, including assessment of clinical history, radiography, biochemical investigation.

NSS57

BONE FRAGILITY AND OSTEOPOROSIS IN CHILDREN AND ADOLESCENTS: WHEN AND HOW TO TREAT IT?

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Children and adolescents with chronic diseases are at increased risk for bone fragility and subsequent osteoporotic fractures. Efficacy and safety of available treatment of osteoporosis prescribed for adults remain unclear in pediatric population.

Preventive strategies such as balanced diet, physical activity, optimized calcium and vitamin D intake are the keystone of management of osteoporosis in young patients.

Indication of anti-osteoporotic treatment do not relay on the results of the Bone mineral density but on the presence of non-traumatic fracture. Bisphosphonates seem to be safe and well tolerated in children. Recent studies are published on the safety and efficacy of targeted-drugs such as denosumab.

Algorithm of management of corticosteroid-induced osteoporosis on children and adolescents are different from other secondary osteoporosis. Preventive strategies remain an important pillar of the treatment. Bisphosphonates are indicated in case of high dose corticosteroids used for long period.

NSS58

A SIGNIFICANT PROBLEM FOLLOWING OSTEOPOROTIC FRACTURES: COMPLEX REGIONAL PAIN SYNDROME (CRPS)

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Complex Regional Pain Syndrome (CRPS) is a chronic pain condition that primarily affects the distal extremities, characterized by abnormal sensory, motor, vasomotor, sudomotor, and trophic findings. It typically develops following fractures, surgeries, trauma, or strokes, with pain that is disproportionate in intensity or duration to the inciting event. The most common trigger is a fracture, particularly of the distal radius.

Notable risk factors for CRPS include advanced age, female sex, and osteoporosis. Pain and functional limitations in the affected limb frequently hinder daily activities and significantly impair quality of life. Women are four times more likely to develop CRPS than men, with incidence increasing with age and peaking between 50 and 80 years. In the United States, the 5-year incidence is approximately 0.079%, while in South Korea, the prevalence is 26 per 100,000 individuals.

The potential pathophysiological mechanisms underlying CRPS include central sensitization, vasomotor dysfunction, autoimmunity, inflammation, psychological distress, brain changes, and genetic predisposition. However, it remains uncertain whether these mechanisms are causative or secondary to the condition's symptoms.

Early diagnosis and treatment are crucial for achieving optimal outcomes. Diagnosis is guided by the Budapest criteria, which require: ongoing pain disproportionate to the inciting trauma, reported symptoms in three categories and observed signs in two categories (i.e., sensory, vasomotor, sudomotor/edema, and motor/trophic), exclusion of other plausible diagnoses through a thorough history and examination. The Valencia consensus has further refined the assessment of fluctuating symptoms, symptom spread beyond a single limb, and the definitions of asymmetry and related changes.

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NSS59

CAN WE TREAT COMPLEX REGIONAL PAIN SYNDROME (CRPS) BY PHARMACOLOGICAL AGENTS?

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At present, there is no FDA-approved pharmacological treatment for patients with CRPS. A variety of pharmacological agents have been studied for CRPS, but most have been small and/or of low quality trials.

Bisphosphonates have emerged as an effective treatment for CRPS pain through interacting with the immune system and regulating expression of nerve growth factor. Meta-analysis shows that biphosphonates provided late (beyond one month) but not early (within one month) pain relief. Ketamine, a strong NMDA receptor antagonist, has been shown to be effective in the treatment of CRPS. IV ketamine infusion can provide clinically effective pain relief in the short term (three to four-weeks follow-up). Biphosphonates and ketamine showed more adverse events but no serious side effects compared with placebo.

Free radical scavengers such as DMSO and N-acetylcysteine (NAC) are widely used in the treatment of CRPS due to the excess free radical production generated by an overt inflammatory response to tissue injury. However, current studies have demonstrated no evidence to support the use of these.

There is evidence to support glucocorticoids in CRPS, but the ideal administration route and dose remain unclear. High doses of glucocorticoids have been found beneficial in CRPS, especially in its early stages. NSAIDs are being used in clinical practice to target the pain and inflammation underlying CRPS, but the study did not find a significant difference when compared with placebo. Significant reductions of pain and sensory disturbances in acute-stage CRPS patients were found on intravenously administered magnesium in a pilot study.

Careful selection and prompt initiation of appropriate pharmacotherapy may optimize pain relief in CPRS. Ketamine and bisphosphonates seem to be the best treatments for CRPS when compared with placebo without severe adverse events. However high-quality and long-term RCTs are still required.

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NSS60

THE ROLE OF NON-PHARMACOLOGICAL APPROACHES IN THE MANAGEMENT OF COMPLEX REGIONAL PAIN SYNDROME (CRPS)

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Guidelines for the management of CRPS recommend an interdisciplinary/multidisciplinary, holistic, individually-tailored approach that incorporates pharmacological and non-pharmacological interventions. Non-pharmacological strategies include patient education, rehabilitation interventions, and psychological therapy. Rehabilitation, including physical and occupational therapy combined with relevant exercise program is the first-line treatment for CRPS and should be started as soon as possible together with pharmacological pain relief.

Rehabilitation interventions, usually administered as multi-modal therapies, aim to achieve functional restoration. Functional restoration emphasizes graded physical activity, desensitization and normalization of sympathetic tone, edema control, exercises for flexibility, isometric and isotonic strengthening as well as stress loading, and normalization of the use of the limb in daily life in the context of activities and participation. Various physical modalities (e.g TENS, fluidotherapy, therapeutic ultrasound, pulsed electromagnetic field therapy, low-laser therapy) can be used for their analgesic, anti-inflammatory and tissue-healing accelerating effects. Sensory-motor retraining approaches, mirror therapy and graded motor imagery, may improve disturbed body perception and cortical reorganisation thereby decreasing pain and disability. Pain exposure therapies may be appropriate for patients who have fear of movement. Recent systematic reviews on rehabilitation interventions in CRPS reported some evidence regarding the effectiveness of mirror therapy, graded motor imagery, pain exposure therapy, aerobic exercises, and multi-modal therapy. Evidence regarding other interventions was uncertain due the lack or low methodological quality of trials.

Psychological therapies aim to manage pain, distress and disability by addressing the psychological aspects of the condition. These therapies include cognitive behavioural therapy, acceptance and commitment therapy, counselling and relaxation techniques.

Interventional therapies, including sympathetic and other nerve blocks, neuromodulation techniques (transcranial magnetic stimulation, spinal cord stimulation, dorsal root ganglionstimulation) and neurolytic sympathetic procedures, can be offered for people who have severe pain and disabilty despite conservative treatments.

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NSS61

QUALITATIVE AND QUANTITATIVE CHANGE IN FLS/PFC IN LATAM. AN OVERVIEW

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The Capture the Fracture (CTF) mentorship program has driven substantial growth in fracture liaison services (FLS) across Latin America, increasing the number of active FLS to 83 (Bronze, Silver, or Gold) and Best Practice Framework (BPF) applications. Patient enrollment has risen significantly, with treatment adherence projected to improve by 60%. Key achievements include the implementation of integrated electronic records and interdisciplinary care models. However, challenges persist, such as fragmented data systems and disparities in access. Future efforts aim to expand mentorship, standardize registries, and enhance evaluation capabilities to achieve a 30% reduction in refractures.

NSS62

KEY PERFORMANCE INDICATORS OF PFC/FLS IN LATAM. EXPECTED OUTCOMES BASED ON BC IN MEXICO AND COLOMBIA

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Objective: To describe KPIs performance before and after the occurrence of the IOF Capture the Fracture® Mentorship Programme in Latin America.

Methodology: Data was collected by the International Osteoporosis Foundation (IOF) Capture the Fracture® programme (CTF), Best Practice Framework (BPF) from 2019 to 2024. A multicenter longitudinal analysis was performed on the different KPIs in order to establish patterns for each country, as well as general trends in terms of absolute and relative frequencies. The information was analyzed in R version 4.3.2.

Results: CTF Mentorship Program has established a network of FLSs experts in different countries to foster secondary fracture prevention strategies by increasing the number and performance

of FLSs. In LATAM, the programme initiated in Mexico in 2019, followed by Brazil and Colombia in 2020 and Argentina in 2021.
Given the gap in treatment and follow-up of patients with fragility fracture, CTF developed a set of complementary KPIs.
The KPIs before mentoring (BM) were analyzed in 2019 and after mentoring (AM) in 2020-2023 for Mexico, Brazil, Colombia and Argentina. 2024 was not included since available data was incomplete.
According to the CTF BPF, a PFC/FLS is expected to identify more than 80% of patients with fragility fractures. Starting treatment at 16 weeks, follow-up of treatment, falls and refractures must be assessed. These indicators are classified as low, intermediate, or high (< 50%, 50–80%, and > 80%, respectively).
Identification of hip and vertebral fractures increased by 52% and 87% in 2021 respectively and decreased towards 2023. All patients with hip fracture were evaluated by the FLSs. The biggest difficulty was the access to densitometry in healthcare centers. As for treatment initiation before week 16, the number of FLS doubled AM as did the number of those whith a follow-up plan. AM 100% of FLSs re-evaluated treatment adherence, 90-100% of FLS carried refracture assessment AM vs 83% BM. Risk of falls was re-evaluated by 82% BM vs 100% AM.

Conclusion

KPIs improved after mentoring in the four LATAM countries where the CTF Mentorship programme was conducted. Specifically, indicators related to fracture identification, evaluation and treatment initiation. Additonally, the mentorship programme contributed to improving performance assessment of PFC/FLS.

NSS63

SUCCESSFUL COUNTRY SPECIFIC STRATEGIES TO IMPROVE AND INCREASE THE NUMBER OF FLS

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After FLS mentors were trained, a country specific plan was developped in order to assess current status of FLS already mapped on the CTF map of best practice to specifically assess their state of development, key challenges and topics of interest of FLS coordinators. The initial diagnosis was made through country surveys lead by the IOF regional office and the country mentors. Based on the findings, country specific mentors and the IOF regional teammembers designed tools aimed to create a knowledge community of FLS, support health medical teams to initiate post fracture care programmes as well as contribute with FLS teams to set quality improvement plans and influence national policy members to foster secondary fracture prevention programmes. Several editions of IOF copyright activities took place from 2021 to 2024 in Argentina, Brazil, Colombia and Mexico. As a result, the number of FLS in Latin America increased from 45 in December 2019 to 141 in December 2024, with 45 FLS submitting new data and improved own category with the CTF programme. From a policy perspective, the mentroship programme was also key in the road to reach an strategic collaboration with Mexico IMSS orthogeriatric strategy (which added 10 new country specific mentors), develop the budget benefit calculator for Mexico and Colombia, set a national secondary fracture prevention coalition in Mexico (who penned the Call to Action Mexico[1] published in june 2024).

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NSS64

CHALLENGES AHEAD. GATHERING KEY DATA FOR MONITORING PERFORMANCE AND IMPROVING QUALITY OF PFC/FLS

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FLSs and fracture audits aim to improve post-fracture care and outcomes based on local reality. Pasos® Program is a structured management model based on the Argentine Hip Fracture Registry, international standards and quality indicators for FLSs. It allows the gathering of key data including the initiation of osteoporosis treatment and adherence, aiming to improve care quality and optimize resources. Pasos represents a pioneering regional initiative to address these challenges effectively.

NSS65

PREGNANCY, AND LACTATION A CHALLENGE FOR THE SKELETON

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Both pregnancy and lactation are physiologic conditions mostly occurring in young women, in which calcium homeostasis is high. During this time, female physiology adapts to fulfill the fetal and neonatal calcium and phosphorus requirements. However, there is a small percentage of women that do experience fragility fractures during these times of life.
Pregnancy and lactation-associated osteoporosis (PLO) is an infrequent condition defined by the occurrence of non-traumatic fractures – most frequently vertebral – during the third trimester of gestation and/or the first months of postpartum.
Fractures may be also precipitated in lactating women by increased mechanical strain from the carrying and bending maneuvers with the baby and associated paraphernalia.
Almost a quarter of these patients will sustain a subsequent fracture, and this fracture risk correlates with the number of fractures at time of diagnosis.
Calcium homeostasis is significantly altered during lactation. Accordingly, many regulatory mechanisms such as renal calcium reservation, intestinal absorption, and bone resorption are stimulated. However; little is still known about the regulatory mechanism of calcium metabolism during lactation, and

according to recent studies, genetic factors might also play a relevant role in this condition.
Although there is consensus about discontinuation of lactation and calcium and vitamin D-supplementation as the first steps in the treatment of these patients, there is still controversy regarding the long-term and/or pharmacological management of this condition.
Use of anti-resorptive medications could conceivably blunt postweaning recovery, given that combination therapy blunts the effect of anabolic treatment in women with osteoporosis. The anecdotal data suggest that bone gains from anabolic treatment may persist in reproductive age women without anti-resorptive treatment.
However; women with PLO need to be informed about their potential subsequent fracture risk before deciding for further pregnancies.

NSS66
MOVEMENT RECOMMENDATIONS FOR PREGNANT AND LACTATING WOMEN

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Health benefits of physical activity during pregnancy include reduced risk of excessive gestational weight gain and conditions such as gestational diabetes, preeclampsia, preterm birth, varicose veins, and deep vein thrombosis. There is some evidence that physical activity during pregnancy is associated with a reduced length of labor and delivery complications. However, vigorous leisure activity is associated with decreased birth weight.
Physical activity can decrease symptoms of postpartum depression. Combined with caloric restrictions, it can also help to lose weight after delivery.
Guidelines on physical activity during pregnancy provide recommendations for health professionals as to whether to prescribe physical activity and if so, in what manner. Guidelines from a variety of organizations help address questions about physical activity, such as how long, how far, how often, and at what intensity,
In 2020, the World Health Organization (WHO) released its guidelines on physical activity and sedentary behavior, In line with the global call for action, the development of national guidelines on physical activity has been encouraged and considered as a fundamental constituent of a coherent and comprehensive framework that outlines physical activity policies for public health action.
Recently published 24-hour movement guidelines for adults aged 18– 50 years old provided examples of integration of sleep, sedentary behavior, and physical activity with special consideration for pregnant and postpartum adult women. This should help in the decision-making process and are intended for endorsement by the policymakers.

NSS67
ABDOMINAL AORTIC CALCIFICATION, WHAT IT IS AND WHY IT IS IMPORTANT

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Background: In older individuals at high risk of musculoskeletal disorders, after the skeleton, the most calcified structure in the body is often the vasculature. One of the first sites where vascular calcification occurs is in the abdominal aorta. This abdominal aortic calcification (AAC) is commonly seen on lumbar spine and abdominal investigations, particularly vertebral fracture assessment in older people. Typically, it has not been reported due to uncertainty over its prognostic importance and difficulties assessing the extent of calcification. It is essential to improve our understanding of abdominal aortic calcification for both bone and vascular health during ageing.
Objectives: This presentation will provide an overview of how common AAC is, its links with subclinical cardiovascular disease in other vascular beds, how it differs from subclinical disease in other vascular beds and its prognostic importance for cardiovascular events and all-cause mortality from a systematic review and Meta-Analysis. We will also discuss the latest advanced in the automated assessment of AAC and the association with cardiovascular events in routine bone density testing and middle-aged community dwelling adult settings.
Results: AAC is one of the first sites where vascular calcification is observed and is related to risk of atherosclerotic vascular disease in other vascular beds. The prognostic importance of AAC for a multitude of cardiovascular outcomes has been established through a large systematic review and meta-analyses and provides complimentary prognostic information to coronary and carotid imaging. We have recently also published the methods for automated assessment of AAC on vertebral fracture assessment images using the Kauppila 24-point scoring system.
Conclusions: This presentation will provide an overview of what AAC is, what is not, and outline recent advances in the field as well as highlighting areas for future research.

NSS68
ABDOMINAL AORTIC CALCIFICATION AND MUSCULOSKELETAL OUTCOMES

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Background: Severe abdominal aortic calcification (AAC) is associated with poor musculoskeletal health status regardless of the method used for the AAC assessment (X-ray, DXA, CT, human reader, AI algorithm).
Objectives: Present the association between AAC and musculoskeletal outcomes.

Results: Severe AAC is associated with lower bone mineral density (BMD) measured by DXA. However, data are discordant and depend on the cohort (e.g., age range), statistical model (threshold for AAC, adjustments) and skeletal site. More limited data suggest poor bone microarchitecture (thinner cortices, lower trabecular number) in older adults with severe AAC. Some studies show more rapid bone loss in individuals with severe AAC, but the results are discordant. Severe AAC is associated with higher prevalence and incidence of fractures (Gebre, J Gerontol A Biol Sci Med Sci, 2023). The link between severe AAC and fracture is found consistently for the spine and hip fractures in men and women and after adjustment for confounders (age, BMD, prior fractures); however, the predictive power of AAC decreased with the follow-up duration. By contrast, the associations between AAC and non-spine-non-hip fractures were inconsistent. Data on the link between AAC and muscle mass and strength are more limited and discordant. Finally, severe AAC was also associated with higher risk of injurious fall necessitating hospitalization.
Conclusions: Several mechanisms may underlie these associations. AAC, poor bone status and low muscle mass and strength may share risk factors (smoking, inflammation, oxidative stress etc.). Severe AAC may impair blood supply of bone and muscles. Low muscle strength and cardiovascular diseases (of which AAC is a valuable marker) may jointly contribute to the higher risk of fall. Finally, poor bone status and falls may jointly contribute to the higher risk of fracture.

NSS69

ABDOMINAL AORTIC CALCIFICATION AS A NOVEL RISK FACTOR FOR FALLS AND FRACTURES IN ROUTINE CLINICAL PRACTICE

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Background: Abdominal aortic calcification (AAC) is strongly associated with cardiovascular events. Emerging evidence suggest that AAC may also be a clinically useful marker for adverse musculoskeletal outcomes such as falls and fracture.
Objectives: Since 2010 the Manitoba BMD Program has been routinely using DXA-based vertebral fracture assessment (VFA) images to identify vertebral fractures in qualifying individuals. These same VFA scans can be used opportunistically to accurately score AAC using machine learning algorithms (ML-AAC). We review our experience with ML-AAC assessment in the routine clinical practice setting.
Results: Elevated ML-AAC scores robustly predict a range of major adverse cardiovascular events. More recently, we have shown that these scores predict risk for hospitalization-associated falls and incident fractures independently from other clinical risk factors. For example, increasing ML-AAC and vertebral fracture status contribute additively to risk for subsequent major osteoporotic fracture, hip fracture and any clinical fracture.
Conclusions: DXA-based vertebral fracture assessment (VFA) can be used in routine clinical practice for ML-AAC scoring in addition to vertebral fracture recognition. These complementary measures can contribute to risk assessment across multiple domains: cardiovascular, falls, and fracture.

NSS70

PROVISION OF ABDOMINAL AORTIC CALCIFICATION RESULTS TO PATIENTS

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Background: Identification of abdominal aortic calcification (AAC) is potentially highly clinically significant if this indicates risks of future cardiovascular and other adverse health events that to the patient and clinician were previously unknown.
Objective: The aim of this presentation is to briefly describe our recent randomised controlled trial providing AAC results and use individual patient cases to illustrate clinical circumstances where identification of AAC may justifiably alter recommended management of patient cardiovascular disease and fracture risks.
Results: Provision of AAC may improve cardiovascular risk factor control over 12 weeks. AAC may also change assessment of cardiovascular disease risk from intermediate to high warranting more aggressive treatment of hyperlipidemia and/or blood pressure. AAC may change estimated risk of fracture from intermediate to high, warranting recommendation for fracture prevention therapy. AAC may change estimated risk of fracture from high to very high, warranting consideration of anabolic therapy. In instances where AAC identification does not alter CVD or fracture risk classification, the presence of AAC conceivably may increase perceived importance of therapy to the patient.
Conclusions: AAC has the potential to alter management of both cardiovascular disease and fracture risk factors significantly and appropriately. However, additional investigations are needed to determine the degree to which identification of AAC and appropriate communication of its significance to health care providers and patients does alter patient risk management choices.

NSS71

INTRODUCTION IN BONE, MUSCLE AND FAT INTERACTIONS

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The concurrent occurrence of osteoporosis, sarcopenia, and obesity is apparent in neurodisabled (NDS) individuals. The interplay among bone, muscle, and adipose tissue in NDS is intricate and affected by many physiological alterations stemming from immobilization, modified muscle tone, and nervous system dysfunction. The interaction of bone, muscle, and adipose tissues is essential for sustaining general health, and this link is especially important in NDS. Sarcopenia diminishes physical activity, leading

to reduced energy expenditure and heightened risk of obesity and immobilization-related bone loss. An elevation in visceral fat provokes inflammation, which facilitates the onset of sarcopenia. Osteoporosis, sarcopenia, and sarcopenic obesity are linked to metabolic diseases, morbidity, and death. Comprehending these connections is crucial for formulating successful intervention and rehabilitation strategies.

NSS72

(OSTEO)SARCOPENIA AND SARCOPENIC OBESITY IN NEURODISABLED INDIVIDUALS

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Osteosarcopenia is a syndrome characterized by concurrent loss of bone mineral density and reduction in muscle mass, strength, and function, which may be avoided. Despite the heightened prevalence of osteoporosis risk factors in individuals with neurodisabilities (NDS), no guidelines exist. Variations in injury type, disease progression, life expectancy, residual mobility and functionality, ambulation and standing ability, pharmacological treatment, spasticity levels, and depression further complicate the pathophysiology of bone-muscle loss and fat gain. Sarcopenia and osteoporosis are highly prevalent in NDS; nevertheless, the extent of disability attributable to osteosarcopenia syndrome remains undetermined. Muscle degeneration and dysfunction occur with aging; however, in neurological illnesses characterized by muscular atrophy, muscle loss can manifest at younger ages. The etiology of sarcopenia in NDS is intricate. One factor is the unloading of impaired skeletal muscle, leading to deconditioning in any muscle that remains inactive. Reduced muscle mass can be attributed to neurogenic injury, resulting from muscular atrophy and impaired regulation by the central nervous system. Neurological impairment results in the inactivation and subsequent unloading of the impacted skeletal muscle. The risk of diminished physical activity ability commences soon following the injury. Disuse, spasticity, and microvascular injury contribute to significant morphological, and enzyme histochemical alterations observed in paralyzed skeletal muscle, resulting in modified functional characteristics and atrophy. The mortality of motoneurons and muscle denervation must contribute to the pronounced atrophy observed in muscles. Malabsorption results in protein deficiencies and muscle catabolism. Thyroid hormonal imbalances, hypercortisolism, and insulin resistance contribute to sarcopenia due to protein insufficiency. Sarcopenic obesity has lately been characterized as a unique entity. It is marked by a detrimental cycle involving muscle and adipose tissue, which includes proinflammatory cytokines, oxidative stress, and insulin resistance, potentially leading to frailty and increased mortality risk. Significant alterations in body composition encompass an augmentation of body fat and a reduction in skeletal muscle and bone mass. The intricate interaction of shared pathophysiological pathways, including heightened bone resorption, proinflammatory cytokines, oxidative stress, insulin resistance, hormonal alterations, and reduced physical activity, underpins the strong association between osteoporosis, sarcopenia, and sarcopenic obesity. A detrimental loop may occur between the buildup of adipose tissue and the reduction of skeletal muscle mass and bone density, as they exert reciprocal effects on one another.

NSS73

SARCOPENIA IN HEMIPLEGIA AND STROKE

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A significant reduction linked to neurogenic lesions results in stroke related sarcopenia. This type of secondary sarcopenia is challenging to define using the existing sarcopenia criteria for this cohort. Stroke is a condition that significantly affects the human body. The brain damage incurred adversely affects numerous bodily systems. The outcome of sarcopenia following a stroke involves many processes and their associated illnesses that transpired post-event. The resultant sarcopenia is attributable to multiple factors post-stroke, including denervation and reinnervation of muscle units, restricted muscle utilization and mobility, spasticity that emerges during the recovery phase, structural alterations as a response to adaptation to the subsequent conditions, as well as the systemic impact of brain injury on the body. Sarcopenia following a stroke is consequently a result of multiple influences. While one might assume that the pathophysiology of post-stroke sarcopenia resembles that of age-related sarcopenia, significant differences have been identified. The body adopts distinct mechanisms leading to muscle tissue disorder in post-stroke sarcopenia, although some similarities with age-related sarcopenia persist. Characteristics of sarcopenia following a stroke have been recorded: Following a stroke, there is a swift reduction in motor units, a structural alteration in skeletal muscle, subsequent disability which predominantly dictates the residual function based on the degree of brain lesion, and continuously affects it etc. It is important to note that the changes in the structure, function, and quantity of skeletal muscles are independent of the patient's age.

NSS74

DISCUSSION IN BONE, MUSCLE AND FAT INTERACTIONS

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Recommendations have been proposed regarding the overall treatment and management of osteosarcopenia, primarily in elderly able-bodied individuals, focusing on exercise, nutrition, and pharmacological interventions under investigation. However, there is a deficiency of disease-specific guidelines for the management, treatment, and potential prevention of NDS individuals requiring comprehensive care. Currently, exercise combined with appropriate nutritional adjustments to facilitate weight loss while minimizing muscle loss may be employed for the prevention and management of sarcopenic obesity. Lack of physical exercise and poor dietary practices lead to the rising prevalence of this condition among the NDS population. This NSS evaluates health concerns and emphasizes the necessity for tailored solutions.

NSS75

DECODING SKELETAL COMPLICATIONS IN BONE METASTASES

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Bone and bone marrow serve as significant locations for cancer spread. The onset of bone metastases is often associated with a worse prognosis. The consequences of bone metastases are often devastating, and once tumors metastasize to bone, they are incurable and cause skeletal complications, including severe pain, fractures, spinal nerve compression, and paralysis.
The prevention and management of bone metastases are essential to cancer treatment protocols. Nonetheless, the current therapeutic alternatives for patients with bone metastatic disease are limited in their effectiveness and can lead to increased morbidity. As a result, most modern treatments are primarily palliative.
Tumor cells can disseminate early but remain dormant in the bone, often for years. Interactions with bone cells, such as osteoblasts and hematopoietic stem cells, promote dormancy.
The bone microenvironment can inhibit tumor growth by inducing dormancy and suppressing processes like angiogenesis and immune responses. A deeper understanding of the interplay between the tumor cells and the bone microenvironment is crucial for creating novel, more successful therapies that increase patients' quality of life and clinical results.
In this talk, we will review what molecular and cellular mechanisms drive bone metastasis, how the tumor cells metastasize to the bone, interactions between tumor cells and the bone marrow niche to influence the tumor cell behavior and their ability to colonize bone, and frequent preclinical models to study cancer spreading to bones.

NSS76

TREATMENT OF BONE METASTASIS – STATE OF THE ART 2025

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Bone metastasis corresponds to the localization of tumor cells in bone, at a distance from the primary tumor. Many bone metastases are asymptomatic. However, it has been estimated that 50% of patients with bone metastases will develop major complications such as : severe bone pain, hypercalcemia and pathologic long bone or vertebrae fractures.Major advances have been obtained in cancer treatment for the last ten years and a significant number of patients now benefit from prolonged remissions, even in the metastatic setting. Thus, to preserve mobility and prevent bone metastasis complications is essential. This should be done in harmony with the oncology care programme and patient's wishes and condition. Regarding bone metastases, the challenge is to identify metastatic locations that are at risk of complications (pain, fracture and neurological risk) to propose a personalised strategy after a systematic decision-making algorithm. The treatment strategy is based on local and systemic bone treatments. In complex cases we advice to follow a multidisciplinary approach with onco-rheumatologists, orthopedic surgeons, interventional radiologists, radiotherapists and oncologists at the bone metastastasis multidisciplinary consultation meeting (BCM3).

NSS77

CTIBL – SIZE OF THE PROBLEM AND TREATMENT OPTIONS?

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Osteoporosis is one of the most frequent diseases in postmenopausal women leading to an increased fracture risk due to the physiologic loss of the bone protective effects of estrogen. Hereby, several risk factors for fracture such as prevalent fracture, low BMD, age, family history, use of glucocorticoid use etc. have been identified. Additionally, the further reduction of endogenous estrogens with chemotherapy (CHT), GnRH-analoga or aromatase inhibitors (AI) continuously increases fracture

risk. Breast cancer (BC) on the other hand is the most frequent cancer type in women. Recent reports indicated a continuous increased incidence while mortality, due to early diagnosis and treatment improvements is decreasing. Dependent on specific tumor characteristics, radiation, chemotherapy (CHT), antibody treatment as well as endocrine treatment has been introduced into the adjuvant clinical treatment setting.
Some but not all of this cancer specific treatments interfere with bone turnover leading to an accelerate bone loss referred to as cancer treatment induced bone loss (CTIBL). Whereas CHT leads to an unspecific increased of bone resorption, Aromatase inhibitor (AI) reduces residual serum endogenous estrogen level and is associated with a decrease of bone mineral density (BMD) and increased fracture risk. Independent of the type of AI administered, bone loss is 2-3 fold increased compared to healthy, age matched postmenopausal controls. Therefore several guidelines have emerged to help managing CTIBL in women with BC including strategies to identify and treat those at highest risk for fractures.
The lecture will summarizes the current knowledge on CTIBL and fracturing risk and indicates current treatment guidelines and intervention options.

NSS78

WHAT ARE 'A LARGE LANGUAGE MODEIS' AND HOW CAN THEY BE DEPLOYED IN OSTEOPOROSIS?

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Artificial intelligence is rapidly moving from the realms of science fiction, into the real-life deployment in clinical workflows. Computer vision leads the way in the use of AI in clinical practice but Large Language Models (LLMs) are catching up and may soon overtake computer vision as the major use-case of AI in healthcare.
In order to prepare for this wave of development, this presentation will take the audience from LLM-naïve to expert via comprehensive explanations of tokenisation (the process of breaking text into smaller units, like words or subwords, for easier processing), prompt-engineering (designing and refining input prompts to guide AI models, optimizing their responses for specific tasks or outcomes) and an examination of the transformer model architecture (transformer models being at the heart of the Generative Pre-trained Transformer (GPT, as in ChatGPT) which sits at the forefront of AI development).
We will finish by exploring case studies of LLMs in use in clinical practice, including ambient recording of clinical consultations, from which the electronic patient record notes are automatically created as well as the patient letter and any other correspondence. We will consider how this can be used in the field of osteoporosis and the risks and limitations (including LLM 'hallucinations').

NSS79

HEALTH EQUITY CONSIDERATIONS WHEN USING AI IN CLINICAL PRACTICE

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There is much fanfare regarding the deployment of artificial intelligence (AI) in clinical practice. However, the deployment of AI raises profound challenges for health equity, particularly in its potential to exacerbate existing disparities in healthcare access and outcomes. This presentation will critically examine health equity considerations in the use of AI within clinical practice, with a focus on data diversity, inclusivity and generalisability.
The STANDING Together initiative is a set of recommendations designed to mitigate these risks. Developed through an international consensus process involving representatives from 58 countries, STANDING Together provides guidance for those creating and using health datasets on minimising biases in AI health technologies. The recommendations address the complexities of health data and the importance of context, aiming to ensure the development of safe and effective AI tools that benefit everyone, regardless of background. www.datadiversity.org Ultimately, this presentation will emphasize that the ethical and equitable application of AI is not merely a technical challenge but a moral imperative in clinical practice.

NSS80

AI FOR VERTEBRAL FRACTURE SCREENING: A UK PERSPECTIVE – AN UPDATE FROM THE ADOPT STUDY

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Opportunistic vertebral fracture detection has the ability to identify patients for secondary fracture prevention who would otherwise fly under the radar. It uses computer vision (a form of AI) to automatically identify vertebral fractures can be missed as part of the radiology review. This is not simply because the CT scan (for example) is performed to investigate anther pathology, (e.g. lung cancer) but because the sagittal sections, on which vertebral fractures can be identified, are not processed or available. This provides an opportunity to identify patients who have had vertebral fractures and are therefore at risk of further fractures, arrange bone assessment and intervene to reduce their fracture risk. Fracture Liaison Services provide a potential vehicle via which to manage these patients once they are identified by

radiology departments.
In the final presentation in this symposium we will share the latest insights from the recent AI-enabled Detection of Osteoporosis for Treatment (ADOPT) study of a computer vision approach to opportunistically identify vertebral fractures from routinely performed CT scans. The trial is led by Professor Kassim Javaid and includes 7 centres across the United Kingdom.

NSS81

DXA QUALITY, COMMON ERRORS AND CLINICAL IMPACT

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When performed well, DXA is an outstanding clinical tool to assess skeletal status. Notably, DXA scans are often an integral component of osteoporosis diagnosis, fracture risk assessment and treatment monitoring. Unfortunately, issues exist with DXA acquisition, analysis and interpretation such that low quality reports are generated. Indeed, globally, DXA errors have been reported to occur in up to 90% of scans. Such errors can be due to incorrect scan acquisition/analysis or subsequent interpretation. These errors may lead to incorrect clinical care decisions such as undertreatment, excessive use of laboratory testing or prescription of unneeded pharmacologic therapy. This presentation will provide example cases where DXA errors led to incorrect BMD or T-score calculation negatively impacting clinical decision-making. Specific common errors including inappropriate information for osteoporosis diagnosis, BMD monitoring and vertebral fracture identification will be noted and how to avoid them considered.

NSS82

THE ABCS OF DXA AND HOW TO IMPROVE

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It is well documented that bone density assessment by dual-energy x-ray absorptiometry (DXA) is often suboptimal worldwide. Published data suggests technical errors are common and related to incorrect patient positioning, acquisition and/or analysis. Inappropriate positioning and acquisition can contribute to inadequate imaging of necessary anatomy, suboptimal region of interest placement or inappropriate soft-tissue sampling. Similarly, analysis errors can result in incorrect bone mineral density (BMD) calculation and associated T- and Z-scores. These mistakes contribute to interpretation errors which may result in incorrect diagnosis and monitoring inaccuracies.The purpose of this presentation is to provide a basic review of hip and spine DXA acquisition and analysis using GE and Hologic densitometers. This will include examples of common errors and how to identify them. Finally, guidance on how to improve testing and promote acquiring a high-quality exam will be reviewed.

NSS83

EXPANDING DXA FUNCTIONALITY TO ENHANCE CLINICAL CARE

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With the progression of DXA technology has come opportunity for extended utility. The greater spatial resolution of the most commonly used DXA machines means that radiograph-quality images are now obtained. These technical developments enable imaging of lateral views of the lumbar and thoracic spine for vertebral fracture assessment (VFA) and full-length femur imaging (FFI) for assessment of atypical femur fractures (complete and incomplete). Both offer advantageous by enabling a comprehensive set of scans to be performed on DXA without the requirement for extra radiographs. Furthermore, image processing methods applied to DXA images have led to a texture-based analysis of PA lumbar spine scans, giving the Trabecular Bone Score, which has been shown to predict fracture independently of BMD. Clinical guidelines for the application of these non-BMD tools exist.
The aim of this part of the symposium will be to briefly discuss each of these methodologies, the principles behind them and advantages and disadvantages of each.

NSS84

INTRODUCTION: ORAL HEALTH AND BONE HEALTH. A QUOTIDIAN DILEMMA?

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Oral health problems are very common all over the world. Up to half of the population has disorders as untreated caries, severe periodontal disease, anodontia and even forms of oral cancer[1]. The frequency of poor oral health in older people is considered very high worldwide, with a notable impact on general health and quality of life[2].
Osteonecrosis of the jaw is a rare but devastating complication. It tends to occur in patients undergoing invasive dental procedures who are receiving certain medications, particularly anti-resorptives (for the treatment of osteoporosis and bone complications of some tumors) and anti-angiogenic agents (for the treatment of some forms of cancer). It is currently known as medication-related osteonecrosis of the jaw (MRONJ)[3]. Current treatment guidelines agree on the need to limit, as far as possible, elective invasive bone procedures during treatment with these groups

of medications and emphasize the convenience of identifying dental and oral problems that may require invasive interventions with a higher risk of complications with MRONJ[3]. Clinicians who diagnose osteoporosis and a high risk of fractures in a patient should frequently consider the initiation of anti-resorptive drugs (bisphosphonates or denosumab), which are recommended as first-choice agents in a high percentage of these patients[4]. How can we improve identification of major oral health problems? Who should be referred for a dental treatment before the use of certain drugs?

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NSS85

THE OVERALL IMPACT OF ORAL HEALTH IN THE ELDERLY

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Worldwide life expectancy has increased significantly. Osteoporosis increases as age advances and in the forthcoming years we will face enormous numbers of osteoporosis-related fractures[1].Osteoporosis is a global major health problem. Despite this, big gaps remain on the treatment of this disease[2], one of the reasons for this, may be the fear of developing jaw osteonecrosis, conceptually related with drugs widely used to treat osteoporosis[3]. As a person grows older, there are high possibilities to need an increasing number of medications, many of them adversely affecting the bone. Also, advancing age is associated with lower levels of serum vitamin D, closely related to musculoskeletal health[4,5].

The prognosis of an elder is closely related to oral health. Aging brings an increase in diverse oral pathologies carrying a risk of chronic low-grade inflammation (inflammaging), which is related to frailty and osteoporosis per se, and in a bidirectional mode, to periodontitis and oral health[6]. Several factors directly affect oral health, including age, poor oral hygiene, nutritional status, and smoking. Despite these facts, in clinical practice not every patient has a proper oral examination from their physicians treating osteoporosis. In this symposium we address a practical approach to these problems, intimately linked and frequently forgotten.

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NSS86

OSTEOPOROTIC FRACTURES AND MEDICATION RELATED OSTEONECROSIS OF THE JAW (MRONJ): SOBERING STATISTICS

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Treatment with **anti-resorptive agents** such as bisphosphonates and denosumab is one of the most effective strategies for reducing the risk of osteoporotic fractures, significantly decreasing the associated morbidity and mortality. These therapies prevent millions of fractures annually, improving quality of life and preserving functional independence in older adults.

However, a rare but important concern is **medication-related osteonecrosis of the jaw (MRONJ)**, which occurs infrequently in patients receiving these therapies at standard doses for osteoporosis. The estimated risk is extremely low, with an incidence of less than 0.1% when used according to established clinical guidelines. The risk may increase in the presence of invasive dental procedures or predisposing factors such as periodontal disease.

In contrast, patients treated with **much higher doses of anti-resorptive agents** for the management of **metastatic bone malignancies** or advanced cancers face a significantly increased risk of MRONJ, ranging from 1% to 12%. This is due to the substantially higher potency and frequency of doses required to control cancer progression.

Conclusion: The benefit of reducing the risk of fractures through anti-resorptive therapy far outweighs the extremely low risk of developing MRONJ when these agents are used at standard doses for osteoporosis treatment. **Dental prevention** and proper oral health management are essential to further minimize this risk, particularly before initiating long-term therapy, ensuring a

favorable risk-benefit balance in the comprehensive management of the patient.

NSS87

IMPROVING ORAL SCREENING: THE ORAL HEALTH ASSESSMENT TOOL

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Although uncommon, MRONJ has devastating impacts on those who suffer from it. Dental health professionals fear the possibility of facing such conditions. Current treatment guidelines agree on the need to limit, when possible, performing invasive dentoalveolar operations (tooth extraction or implant placement), planning to perform them before starting therapy with certain drugs[1]. It is important to evaluate (and address) the coexisting risk factors to develop MRONJ, particularly exposure to glucocorticoids and tobacco[1].

Is the average Clinician qualified to identify meaningful features of oral health? A study in United Kingdom revealed several gaps in the ability of general practice trainees to identify common problems in oral health[2]. A prospective study in prostate cancer patients showed that instituting strict dental health surveillance reduced significantly the risk of MRONJ compared to those patients subject to dental treatments driven by symptoms[3]. Interactions between clinicians and dental health professionals may lead to improvements in general health, quality of life and even life expectancy of their patients[4].

Oral Health Assessment Tool (OHAT) may be instrumental in improving clinicians' dexterity in the identification of oral health problems and to refer patients to appropriate dental treatments[5]. Better screening for oral health problems, may be accessible to the busy clinician and have a positive impact on general and skeletal health of patients at risk.

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NSS88

VITAMIN D: FROM NATIVE TO ACTIVE FORM IN CKD-ASSOCIATED OSTEOPOROSIS

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Chronic kidney disease (CKD) is a recognized cause of osteoporosis, with a complex pathophysiology involving the interplay of uremic toxins, disturbances in mineral metabolism, and alterations in immune, endocrine, neurohormonal, and gut systems. Vitamin D deficiency is common in patients with CKD, and may be associated with secondary hyperparathyroidism and abnormal mineralization. Current guidelines recommend supplementation with native vitamin D to avoid these complications. However, data on skeletal outcomes in patients receiving vitamin D supplementation are lacking. Active vitamin D derivatives have been used to manage hyperparathyroidism in these patients. However, excessive suppression of parathyroid hormone and a reduced bone formation rate may lead to decreased bone quality, thereby increasing the risk of fractures. Also, they could be associated with hypercalcemia and hyperphosphatemia. Therefore, these compounds should be prescribed with caution.

NSS89

VITAMIN K: INSTRUCTIONS FOR USE IN SKELETAL FRAGILITY

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Vitamin K acts as a carboxylase coenzyme, catalyzing the carboxylation of several vitamin K-dependent proteins.

Beyond its well-known effects on blood coagulation, it also exerts relevant effects on bone and the vascular system.

An adequate vitamin K intake is important to obtain sufficient levels of carboxylated (active form) vitamin K-dependent proteins, such as osteocalcin and matrix Gla protein, to prevent bone and vascular health. Another bone-related action Vitamin K is a ligand of the nuclear steroid and xenobiotic receptor (SXR) (in murine species Pregnane X Receptor: PXR), expressed in osteoblasts. There are two main types of vitamin K vitamers: Phylloquinone (or PK) and Menaquinones (MKn).

Epidemiological studies showed that its deficit was associated with increased fragility fractures, vascular calcification, and mortality. It has been highlighted that the uremic state is a condition of greater vitamin K deficiency than the general population.

However, few available studies, especially in CKD patients, have pre-specified outcome bone fractures, indicating that we need more clinical studies to confirm that vitamin K is a potential therapeutic agent for bone fractures.

NSS90

THE STATISTICIAN IN DETECTING FRAUD AND NEGLIGENCE IN CLINICAL TRIALS

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Clinical trials are the cornerstone of evidence-based medicine, but the integrity of the data on which they rest can be undermined by fraud and negligence. The role of statisticians in identifying and mitigating these issues is crucial, especially when considering the far-reaching consequences of compromised research. This talk will focus on how fraud and negligence can manifest in clinical trials, with particular attention to studies in the fields of osteoporosis and vitamin K. Osteoporosis, a debilitating condition affecting millions globally, has been the subject of numerous clinical trials investigating treatments and interventions. Likewise, vitamin K's role in bone health has been increasingly examined. However, the contamination of trial data—whether through falsified results, selective reporting, or data manipulation—can skew scientific understanding, leading to misguided clinical recommendations and patient care. We will explore how fraudulent activities such as data fabrication, protocol deviations, and selective outcome reporting can go undetected, especially when trials are published without rigorous statistical scrutiny. This is further compounded by negligence, where methodological oversights or statistical errors go uncorrected, creating false confidence in results. The secondary concern is the impact of such compromised data on systematic reviews and meta-analyses, which are essential for synthesizing evidence across multiple studies. Contaminated or biased trial data can introduce significant distortions into the conclusions drawn in these reviews, ultimately influencing clinical guidelines and treatment decisions. The integrity of the systematic review process is therefore dependent on statisticians being vigilant in detecting these issues, applying appropriate statistical techniques, and promoting transparency in data reporting.

This presentation will describe an example of fraud and negligence in literature and will highlight the tools and methods statisticians use to uncover fraud and negligence in clinical trials, including data verification, integrity checks, and advanced statistical techniques for detecting anomalies. Through case studies from osteoporosis and vitamin K research, we will examine the broader implications of compromised trial integrity on public health and policy. The session will conclude with recommendations for improving the transparency and rigor of clinical trial reporting, emphasizing the essential role of statisticians in safeguarding the reliability of clinical evidence.

NSS91

VITAMIN D IN SKELETAL FRAGILITY: A CLINICAL CASE

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A 56-year-old man with diabetic nephropathy and rapid loss of kidney function presented with severe hyperparathyroidism shortly after initiating dialysis therapy. Parathyroid hormone (PTH) levels were 80-100 pmol/L, with hyperphosphatemia (phosphorus 3.0-3.0 mmol/L), normocalcemia (total calcium 2.54 mmol/L) and low levels of 25-hydroxyvitamin D (21 nmol/L). Should vitamin D insufficiency be corrected?

Chronic kidney disease-mineral and bone disorder (CKD-MBD) is a complex condition of disturbed calcium and phosphate metabolism leading to secondary hyperparathyroidism with negative effects on bone and vascular health, contributing to the morbidity and excess mortality of patients with CKD. Drivers of hyperparathyroidism in CKD include phosphate retention, low levels of calcium, and insufficient levels of active vitamin D. With the reduction in nephron mass, the kidneys' ability to produce active vitamin D is reduced; however, extra-renal activation of vitamin D occurs even in patients who are anephric[1], providing a rationale for vitamin D supplementation in kidney failure. Supplementation with cholecalciferol reduces PTH levels in randomised trials, though results are inconsistent[2]. Implementing vitamin D supplementation as routine care in dialysis units leads to decreased severity of hyperparathyroidism[3]. A recent European consensus paper concluded that all patients with CKD, including those in kidney failure receiving dialysis therapy, should receive vitamin D supplementation targeting 25-hydroxy-vitamin D levels >75 nmol/L, to delay the onset, and improve the control of, secondary hyperparathyroidism.[2] Thus, in this case, vitamin D supplementation should be initiated with appropriate monitoring to ensure target levels are reached.

[1]Jorgensen, H. S. *et al.* Vitamin D Metabolites Before and After Kidney Transplantation in Patients Who Are Anephric. *Am J Kidney Dis* **84**, 427-436 e421, (2024).

[2]Jørgensen, H. S. *et al.* The role of nutritional vitamin D in CKD-MBD in children and adults with CKD, on dialysis and after kidney transplantation – a European consensus statement. *Nephrol Dial Transplant* (2025).

[3]Holden, R. M. *et al.* Vitamin D Status and Treatment in ESKD: Links to Improved CKD-MBD Laboratory Parameters in a Real-World Setting. *Am J Nephrol* **55**, 638-646, (2024).

NSS92

THE SILENT EPIDEMIC OF OSTEOPOROSIS AMONG ADULTS WITH INTELLECTUAL DISABILITIES

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Objective: To establish the state of the science of bone health in a population of older adults with intellectual disability.

Material and Methods:

This study is part of the Intellectual Disability Supplement to the Irish Longitudinal Study on Ageing (IDS-TILDA), a longitudinal ageing study [2007 – ongoing] collating data across all life domains via pre-interview questionnaires, face-to-face interviews and objective health measures (OM). Data is collected every 3 years which describes a datawave. A 10% representative sample, randomly selected from the National Intellectual Disability Database at Wave 1, included 753 participants, with the sample refreshing to 762 at Wave 5, resulting in an 84% retention rate for continuing participants, refreshment was due to loss to follow up as a result of deaths and participants ageing out of younger groups. The GE lunar Achilles (QUS) was used to establish bone quality in the OM. Participants are aged 40 years and above, living independently or with family, in community group homes or in residential services and of all levels of intellectual disability [mild/moderate, severe/profound]. Participants were asked to provide their doctor's diagnosis of chronic health conditions including osteoporosis.

Results

In total, 19% had a doctor's diagnosis of osteoporosis however on OM 32% were within the osteoporotic range and a further 29.4% within the osteopenic. Increased age, level of intellectual disability and reduced mobility are associated with decreases in bone density. Interestingly, being a younger participant (< 65yrs) and having no mobility issues are associated with an increased likelihood of having osteoporosis but not a doctor's diagnosis. Sex has no association in this population with osteoporosis however severe/profound level of intellectual disability ($p<0.0001$) and having difficulty walking ($p<0.001$) pose increased risk, with medications [antiepileptic ($p=0.004$), and proton pump inhibitors ($p=0.018$)] contributing to an increased likelihood. Concerningly just 25.4% reported having attended DXA.

Conclusion

These findings underscore the need for a critical reassessment of diagnostic criteria and risk assessment tools for those with intellectual disability. The conventional model of osteoporosis risk may be insufficient considering changing epidemiological patterns in this cohort. Recognising this is crucial for effective prevention, diagnosis, and treatment of osteoporosis for all.

NSS93

EXPLORING DIETARY DEFICIENCIES IN ADULTS WITH INTELLECTUAL DISABILITIES CONTRIBUTING TO POOR BONE HEALTH

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Objective

To examine dietary intake in adults with intellectual disability in Ireland and establish patterns that impact on skeletal health.

Material and Methods:

Data from this study was drawn from the IDS-TILDA study. In total N=609 participants took part in the study. Participants completed a food frequency questionnaire (FFQ) comprised of questions on dietary intake across 6 food shelves. These included: Shelves 1) Fruit and vegetables, 2)wholemeal cereals, 3)Milk, yogurt, cheese, 4)Meats, poultry, fish, eggs, 5)Fats and oils, and 6)High sugar, salt. Consumption levels ranged from never/less than once per month, to 6+ portions per day (PPD). The responses were converted into measurable components based on the food pyramid recommended daily amounts (RDA) and mapped to the food shelves. Chi-squared analysis examined the relationship between the FFQ and individuals of all levels of intellectual disability, aged 40 years and above, living independently, in community group homes or in supported residential services.

Results:

This study revealed alarmingly low compliance with nutritional guidelines for key nutrients such as calcium rich products and vitamin D in foods like milk, yoghurt and cheese (shelf 3) with 53%, (n=309/583) of participants not meeting RDA levels. Of those who had a doctor's diagnosis of osteoporosis, 3 in 10 participants were not taking either Vitamin D or calcium supplementation. Similarly, just 18.9%, (n=110/583) of participants met the RDA for foods containing protein (shelf 4) necessary for bone health and repair. Conversely, consumption of foods high in fat, salt and sugar 68%, (n=394/597) (shelf 6) far exceeding recommendations, exacerbating the risk of poor skeletal health.

Conclusion: Dietary intake plays a critical role in bone health, yet adults with intellectual disabilities often fail to meet the recommended dietary allowances essential for maintaining musculoskeletal health. This study examines the dietary intake patterns of a sample of older adults with intellectual disabilities in Ireland and established the imbalanced intake of specific nutrients that play a crucial role in bone health. Overall, considering the high levels of debilitating bone health among this population the collective impression of dietary intake patterns increases their risk further of poorer bone health.

NSS94

SEDENTARY BEHAVIOUR AND ITS IMPLICATIONS FOR THE BONE HEALTH OF THOSE WITH INTELLECTUAL DISABILITY

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Objective
To examine the interplay between sedentary behaviour and inactivity, with skeletal health as measured by the GE lunar achilles (QUS).
Materials and methods
Using Wave 5 IDS-TILDA interview data and objective measurements, sedentary behaviour, activity levels and the barriers faced by individuals with intellectual disability, including mobility issues, environmental constraints, and lack of accessible exercise opportunities are explored. Individuals with all levels of intellectual disability, aged 40 years+, living in a variety of circumstances were included (N= 762), with N=502 completing the objective measures. A GE lunar achilles (QUS) was used to measure bone quality, which was classified into normal, osteopenia or osteoporosis. The Rapid Assessment of Physical Activity (RAPA) questionnaire and an activPAL accelerometer were used to determine activity and sedentary levels.
Results
Sedentary levels of almost 70% were observed. The RAPA identified just 23% of participants met recommended activity guidelines with over 77% inactive. Approximately 65% of participants needed an aid to walk across a room with 60% of participants reporting no difficulty walking 100yards while 18% could not do it at all. The magnitude of the relationship between the QUS osteoporosis category and physical activity [those who were underactive] was (r) 0.59 (p=0.008). Similarly, with consideration to mobility, QUS scores decrease progressively with increasing mobility difficulty, with medium to large effects observed for those with some difficulty (effect size = -0.55, p = 0.0061), a lot of difficulty (effect size = -0.82, p = 0.0060), and very large effects for those unable to mobilize (effect size = -1.77, p < 0.0001), indicating a strong association between reduced mobility and poorer bone health.
Conclusions
Sedentary behaviour and inactivity are significant contributors to poor bone health and are observed at very high rates among this cohort. However, there is an indication that increased activity levels are emerging as protection for bone health. Approaches to improve activity levels among those with intellectual disability need to be creative and engaging to overcome barriers and aversion to exercise. Addressing sedentary behaviour is essential to improving bone health and overall quality of life for adults with intellectual disability.

NSS95

INNOVATIVE SOLUTIONS: THE ECHOLIGHT REMS DEVICE FOR ACCESSIBLE BONE HEALTH SCREENING FOR ADULTS WITH INTELLECTUAL DISABILITY

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Objective: This research study evaluated the feasibility of using an alternative bone health assessment system, namely the Echolight, for people with intellectual disabilities. The Echolight stands as an innovative technology utilising radiofrequency echographic multi-spectrometry (REMS) and it is less demanding in terms of patient positioning compared to the conventional DXA scan.
Methods and Materials: Eighty-four participants with intellectual disability inclusive of mild, moderate or severe/profound levels from service providers in Ireland over the age of 40 years participated in the study. A process-effectiveness design was employed, to establish the feasibility of the Echolight device assessment process with people with intellectual disability. Data was collected from participants via pre, and post scan questionnaires and data generated from the Echolight assessment. Feasibility was defined by >70% success rate of completion and evaluated from the participant experience.
Results: In total, 96% (n=81/84) of the participants completed the assessment successfully with 92.9% of the participants noting they found the scan easy to engage in and 96.2% confirming they would recommend Echolight bone scan to a friend. Overall, 72.5% of participants previously never accessed DXA or alternative bone health screening. A total of 26.2% (n=22/81) were identified to have osteoporosis and a further 36.9% (n=31/81) were within the osteopenic range. Of those who had compromised bone health (n=53/81), 59% (n=33/53, P<.001) had not received a doctor's diagnosis and were unaware of their bone health status.
Conclusion: The Echolight's non-invasive nature, rapid assessment process, and ability to operate in community settings significantly enhance its feasibility for people with intellectual disabilities. The comprehensive demographic analysis in this study provided insight into the correlation between intellectual disability and bone health issues and illustrates the experiences with the Echolight device across various cognitive functioning levels in a group of adults with intellectual disability. The Echolight REMS device offers a transformative approach to osteoporosis diagnosis and monitoring and expands access to reliable bone health screening, paving the way for timely interventions and improved bone health outcomes for this population.
This study was funded by the Nursing and Midwifery Planning and Development unit, Health Service Executive, Dublin & South-East, Ireland.

NSS96

RECOGNIZING AND MANAGING SARCOPENIA IN CHILDREN: REFERENCE MUSCLE MASS VALUES FROM A EUROPEAN COHORT

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Sarcopenia, traditionally considered an aging-related condition, is increasingly recognized in pediatrics, where low muscle mass (LMM) affects growth and health outcomes. Normative muscle mass values are critical for assessing LMM in children, yet current references are limited to a few studies conducted in specific populations, underscoring the need for further research. We aimed to establish age- and sex-specific reference values for muscle mass in healthy children, representing a new population cohort. A cross-sectional analysis of healthy children aged 5–14 years was conducted. Muscle mass was measured using Bioelectrical Impedance Analysis (BIA) after a minimum 8-hour fasting period. Percentile values for Fat-Free Mass (FFM) and Lean Body Mass (LBM) were calculated by age and indexed to weight, height squared, and BMI. In total, 844 healthy children (388 girls, 456 boys) were included. Age- and sex-specific percentiles for FFM and LBM were established and reference values for FFM and LBM adjusted by BMI were reported for the first time. In this session, we will present the methology of our work in detail and provide normative reference values for muscle mass in children, offering a valuable tool for monitoring growth and diagnosing conditions such as sarcopenia and malnutrition.

NSS97

MOLECULAR INSIGHTS, PATHWAYS AND CANDIDATES FOR NOVEL INTERVENTIONS IN SARCOPENIA

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Sarcopenia is a skeletal muscle disorder characterized by a progressive and generalized decline in muscle mass and function. Over the years, numerous breakthroughs have highlighted potential pharmacotherapies with promising findings; however, the multifactorial nature of sarcopenia complicates the development of a single effective treatment. Unlike traditional disease models that focus on singular pathways, sarcopenia arises from a complex interplay of factors, including imbalance in protein turnover, mitochondrial dysfunction, hormonal changes, and chronic low-grade inflammation. Therefore, an ideal pharmacotherapy would need to address multiple pathways simultaneously to achieve meaningful clinical benefits. Among the drug candidates explored, testosterone remains the pharmaceutical with the most substantial evidence base regarding its efficacy and safety in improving muscle health. More recently, BIO101, a mas receptor agonist, has emerged as a promising agent with a novel mechanism of action. Bimagrumab (myostatin receptor agonist) deserves an attention as a potential therapeutic for sarcopenic obesity. In contrast, ghrelin receptor agonists and espindolol are therapeutics with potential in muscle loss associated with anorexia/cachexia, but further evidence is required. microRNA mimetics and inhibitors, drug delivery systems for local treatments, gene therapies, and muscle stem cell transplantation appear to be promising novel approaches on the horizon for the treatment of sarcopenia. Combining therapeutics targeting different pathways with conventional interventions, i.e., nutritional support and resistance exercise, holds more potential for a comprehensive sarcopenia management. In this session, we will discuss the most recent landscape and emerging frontiers in the field of sarcopenia treatment.

NSS98

UPDATED JOINT POSITIONS ON PERIOPERATIVE BONE OPTIMIZATION IN ARTHROPLASTY CANDIDATES 2024

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Osteoporosis and low bone mineral density (LBMD) represent significant yet often overlooked factors in the perioperative management of patients undergoing joint arthroplasty. These conditions contribute to increased periprosthetic bone loss, implant-related complications, and higher revision rates, underscoring the need for an integrated approach to optimize bone health in this patient population. Despite the critical impact of bone quality on surgical outcomes, the routine evaluation and management of bone health remain inconsistent across clinical settings.

The use of antiresorptive and bone anabolic agents has proven effective in mitigating periprosthetic bone loss (PPBL) and reducing implant-related complications after joint arthroplasty. Patients with osteoporosis or bone fragility conditions significantly benefit from these therapies, which preserve periprosthetic bone mineral density (PPBMD), lower revision rates, and minimize non-septic complications. Therefore, routine preoperative assessment of bone health, including bone mineral density (BMD) measurement, is essential to identify candidates for antiosteoporosis treatments. Tailored treatment plans should be based on individualized fracture risk assessments, baseline BMD, and osteoporosis-related factors. Addressing bone health proactively before and after arthroplasty can optimize surgical outcomes, reduce complications, and improve long-term implant survival.

This session presents the latest joint position (FEMECOT, AMMOM,

ACOMM, SCCOT, SECOT, SEFRAOS, SEIOMM) and evidence-based strategies for optimizing perioperative bone health in arthroplasty candidates. Leading experts will discuss the role of antiresorptive and bone anabolic therapies in mitigating periprosthetic bone loss, reducing complications, and improving implant longevity.

NSS99

CURRENT PRACTICES, NEEDS, AND CHALLENGES IN PERIPROSTHETIC BONE MINERAL DENSITY ASSESSMENT: TOWARDS STANDARDIZATION

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Evaluating bone mineral density (BMD) and periprosthetic bone mineral density (pBMD) in candidates for arthroplasty is crucial for preoperative assessment, postoperative tracking, and enhancing clinical outcomes. Despite its significance, current practices for measuring, interpreting, and utilizing BMD remain inconsistent across both clinical and research environments. There is considerable variability in pBMD measurement protocols, regions of interest (ROIs), and analysis methods, which leads to challenges in creating dependable, evidence-based guidelines. These disparities obstruct comparability among studies and impede the effective incorporation of bone health evaluations into standard clinical care for arthroplasty candidates. This session will delve into the state of current practices, highlighting the variability in pBMD assessment and the challenges that arise from it. A significant focus will be on the need for standardization to enhance precision and reproducibility in longitudinal measurements. For instance, the accuracy of repetitive scans relies heavily on factors such as the scanner's hardware and software, patient positioning during scans, and the consistency of follow-up protocols. Studies have shown significant variability in measured pBMD, with coefficients of variation (CV) ranging from 0.6% under optimal conditions to over 20%. This session will focus on the methodological challenges and collaborative efforts needed to create specific guidelines for pBMD measurement, analysis, and reporting. It will also emphasize the importance of education and training for clinicians and radiology technicians to ensure the consistent application of these protocols. Implementing standardized guidelines can enhance the integration of BMD assessment into routine arthroplasty care. By addressing the gaps in clinical practice, research, and education, standardized pBMD assessments can improve patient outcomes, facilitate comparability between studies, and advance the field of arthroplasty care.

NSS100

CURRENT PRACTICES AND EDUCATIONAL NEEDS IN PERIOPERATIVE BONE OPTIMIZATION FOR ARTHROPLASTY CANDIDATES: SURVEY RESULTS

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This session presents the findings of a comprehensive survey on current practices, knowledge gaps, and educational needs among orthopedic specialists involved in arthroplasty. The results reveal significant heterogeneity in perioperative bone optimization and highlight discrepancies in the measurement, interpretation, and follow-up of bone mineral density (BMD) in clinical practice.
Key findings includeMost orthopedic surgeons will change their surgical approach if they find bad bone quality. Only around fifty percent of surgeons perform a *Perioperative Bone Optimization (POBO)*. However, most of them state that if they find Bad bone quality during surgery, they initiate POBO or send the patient to an osteoporosis specialist.
Other findings include a lack of standardized protocols for osteoporosis management, limited preoperative BMD assessments, and varying levels of familiarity with antiresorptive and anabolic therapies. These inconsistencies present opportunities to reduce unwarranted variations in clinical care through targeted educational initiatives and standardized guidelines. The session aims to identify actionable strategies for improving perioperative bone optimization, enhancing surgical outcomes, and promoting evidence-based practices among orthopedic specialists by addressing these challenges.

NSS101

ADIPOSE AND BONE TISSUE. A CLOSE RELATIONSHIP

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Adipose tissue is recognized as an endocrine organ which regulates bone remodeling through the secretion of adipokines and cytokines. En enhanced volume of adipose tissue is linked to low bone mass and fractures, although the detailed interactions between adipose tissue and bone metabolism need further research and study. It is possible and it also is a clinical observation that adipose tissue especially abdominal adipose tissue expands in menopause following estrogen withdrawal and this expansion affects bone remodeling and may induce osteoporosis. The deeper understanding of the relationship between adipose tissue expansion and bone metabolism in a condition of estrogen deficiency may provide novel insights into potential therapeutic targets in osteoporosis.

NSS102

METABOLIC SYNDROME. A PARADIGM OF THE INTIMATE RELATIONSHIP BETWEEN ADIPOSE AND BONE TISSUE

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Metabolic syndrome is characterized by deposition of adipose tissue in the central abdomen leading to abdominal obesity, diabetes mellitus, dyslipidemia and arterial hypertension. The relationship of obesity with bone metabolism is close and may lead to contradictory results as far as bone mineral density is concerned. Obesity is considered to be related to normal bone mineral density by the sheer mechanical effect of the weight on the bone tissue. However, obesity may also have an effect on the bone via the inflammatory mediators adipokines and cytokines produced and lead to disordered bone metabolism and osteoporosis. Therefore, bone metabolism in osteoporosis is a subject which deserves further study.

NSS103

METABOLIC SYNDROME AND OSTEOPOROSIS

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Metabolic syndrome a constellation of symptoms and a phenotype characterized by abdominal obesity, diabetes mellitus type 2, dyslipidemia and arterial hypertension impacts bone metabolism. Its impact reflects the effect of chemical mediators, adipokines and cytokines produced by the adipose tissue on bone tissue. These effects may be detrimental and may lead to osteoporosis. Osteoporosis in the context of metabolic syndrome should be managed by the administration of various agents which have a beneficial effect on bone metabolism. However, metabolic syndrome is also managed by the administration of agents which are used to combat diabetes mellitus type 2, dyslipidemia and arterial hypertension. The effect of these various agents on bone metabolism should also be studied and taken into account when managing osteoporosis in the context of metabolic syndrome.

NSS104

METABOLIC SYNDROME AND DIET. DO THEY AFFECT BONE MASS?

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Metabolic syndrome is characterized by abdominal obesity. Abdominal obesity has differential effects on bone mineral density. Its effects are related to the effect of adipokines and cytokines on bone metabolism. However, patients suffering from metabolic syndrome are overweight and dieting is applied to manage the metabolic syndrome and the excess body weight related to it. Dieting may also have a detrimental effect on the bone. This detrimental effect is related to less weight and its negative effect on bone metabolism. However, this detrimental effect may also be related to nutritional defects related to dieting. The effect of dieting on bone mineral metabolism should be considered when planning diet plans in patients with metabolic syndrome.

NSS105

METABOLIC SYNDROME AND DEPRESSION

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Metabolic syndrome is characterized by abdominal obesity. Abdominal obesity is related to insulin resistance which is related to increased insulin levels. Insulin has a stimulatory effect on beta receptors on vessels which leads to aggressive behavior. Metabolic syndrome is also related to depression. Depression may lead to metabolic syndrome via the effect of depression on eating. Depression may lead to overeating. Overeating leads to the accumulation of adipose tissue and obesity. Obesity may impact behavior and may also impact neurocognitive function and may lead to depression, thus making a vicious cycle. All these data show that metabolic syndrome should be prevented as its effects are not limited to diabetes mellitus, dyslipidemia, arterial hypertension and disordered bone metabolism but also to disordered neurocognitive function.

NSS106

CHALLENGES OF CLINICAL TRIALS FOR NEW OSTEOPOROSIS MEDICATIONS

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The high morbidity and increased mortality of osteoporosis-related fractures are a large and growing public health concern. Given the ageing of the worldwide population, the number of fractures is predicted to substantially increase in the next decades. Currently, several treatments are approved for osteoporosis based on a favorable benefit-to-risk profile, particularly including reductions in the risk of vertebral, hip, and other fractures. However, initiation and long-term use of these effective therapies have decreased in the past decade as a result of concerns about rare side effects and inconvenient dosing requirements, coupled with persistent problems of underdiagnosis and undertreatment of osteoporosis. There is an urgent need to develop new osteoporosis therapies with improved safety profiles, efficacy, and/or convenience to increase patient and clinician adoption.
Randomized trials required for regulatory approval of osteoporosis therapies with vertebral and/or non-vertebral fractures as primary

or co-primary endpoints require large, very expensive multi-year trials in patients at high risk of fracture. Yet, given that effective anti-fracture medications are available, placebo-controlled trials in high-risk patients are no longer ethical, necessitating either active controls or restricting enrollment to lower-risk patients. Both scenarios lead to larger sample sizes and/or longer trials, increasing the cost of drug development and delaying the time for new therapies to reach patients. Consequently, development of new osteoporosis therapies has essentially stalled, with no new anti-osteoporosis medications currently in Phase III clinical trials. A potential solution to improved assessment and approval of osteoporosis treatments is to replace fracture outcomes in such trials with a suitably qualified surrogate endpoint.

NSS107

EVIDENCE SUPPORTING THE USE OF BMD AS A SURROGATE ENDPOINT FOR FRACTURES

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Surrogate endpoints have more statistical power and are more quickly assessed than clinical endpoints. Thus, we aimed to examine the change in total hip BMD after 24 months of treatment as a surrogate measure to replace the clinical endpoint of fracture in osteoporosis clinical trials. To do so, we established the **S**tudy **t**o **A**dvance **B**MD as a **R**egulatory **E**ndpoint (SABRE). We worked with study sponsors under the Foundation of the National Institute of Health to obtain individual patient data from 53 randomized controlled trials with over 170,000 patients. We focused on BMD as it was available in many patients (about 90,000) and had strong prior evidence of potential as a surrogate. The four key steps in identifying a surrogate are 1) there is biological plausibility, 2) there is an association between low BMD and increased risk of fracture, 3) the change in BMD is associated with reduction in the risk of fracture, and 4) there is a threshold that can be used to operationalize the approach, the surrogate threshold effect. We have evidence for each of the steps. Step 3 required a meta-regression of all the clinical trials with total hip BMD change at 24 months in the active and placebo groups. We found a strong association between the change in BMD against fracture risk reduction for vertebral, all clinical and all fractures, with r2 exceeded the critical value of 0.65 recommended for a valid surrogate endpoint. Thus, we have submitted a final qualification package to the Food and Drug Administration proposing that in future clinical trials, the change in total hip BMD at 24 months would suffice for drug licensing.

NSS108

DESIGN CONSIDERATIONS FOR A FUTURE RANDOMIZED TRIALS WITH A TOTAL HIP BMD ENDPOINT

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Since 2018, the Study to Advance BMD as a Regulatory Endpoint (SABRE) project has been working with U.S. Food and Drug Administration (FDA) to gain formal qualification for the change in total hip BMD as a surrogate endpoint for fracture in future trials of new osteoporosis treatments. To this end, we submitted the 'final qualification package' to the FDA in 2024 and are expecting to receive a decision from the FDA in early 2025. If the change in total hip BMD is qualified by FDA, the surrogate threshold effect (STE) would guide regulatory drug approval. For example, for all clinical fractures, the STE is 2.04%. Therefore, a drug that showed an average 24-month increase ≥ 2.04% in total hip BMD (active versus control) would be approved. All previously approved osteoporosis therapies that were effective for clinical fractures would have met or exceeded this threshold, providing validity to this approach. If the surrogate is qualified by FDA, we hope to expand the qualification outside of the U.S.

This presentation will discuss design considerations for a future trial with an endpoint of total hip BMD change. Use of the surrogate would apply to trials of postmenopausal women with osteoporosis and/or increased risk of fracture. Our analyses indicate that a trial size of at least 500 women (250 per treatment group) would be required. A somewhat larger sample in the active treatment group might be needed to meet requirements for safety (at least 300 patients exposed ≥ 6 months) established by the International Council for Harmonization of Technical Requirements for Pharmaceuticals for Human Use (ICH). Sequential placebo then active treatment regimen and/or an active control study designs might be considered since we have evidence that results from the studies of romosozumab and abaloparatide are consistent with our proposed approach using BMD as a surrogate endpoint. For safety, the current requirements for pre-clinical studies and assessment of bone quality in humans by bone biopsies would remain as they are. ICH requirements for exposure would need to be satisfied across the Phase 1-3 studies in the development program. In addition, post-marketing safety studies might also be required by regulatory agencies to assess rare safety issues.

NSS109

BONE CONSEQUENCES OF PREMATURE OVARIAN INSUFFICIENCY (POI)

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The usual age of menopause globally is between 48 and 52 years. Premature ovarian insufficiency (POI), loss of ovarian function occurring before the age of 40 years and affects around 2–4% of women. Long-term health concerns associated with POI include an increase in cardiovascular disease, cognitive dysfunction, and reduced bone mineral density (BMD), as well as reduced overall quality of life and life expectancy, largely due to cardiovascular disease. Peak bone mass is usually achieved during the third decade of life, and estrogen deficiency during childhood to young adulthood can impair optimal peak bone mass. Depending on the age of menopause, women with POI may experience both lower peak bone mass, and earlier menopausal bone loss, predisposing to osteoporosis and fractures. Risk factors for lower BMD in women with POI include lower age of menopause, low vitamin D, low body weight, lack of exercise, delay in diagnosis, poor adherence to menopause hormone therapy (MHT), and low calcium intake. Despite affecting significantly more women than POI alone, there is a relative paucity of data on bone health in women with POI, and studies examining osteoporosis and fracture risk in these women have had mixed results, with some showing increased risk and others showing no difference. International guidelines recommend the use of MHT in women with POI, until the usual age of menopause. MHT has been shown to improve BMD in these women, and, although evidence for fracture reduction in this population is unclear, data extrapolated from studies in postmenopausal women in general has shown significant fracture reduction. Clinical guidelines recommend screening with dual X-ray absorptiometry (DXA) and treatment with MHT for most women with POI to reduce osteoporosis and fracture risk; however, some studies indicate gaps in osteoporosis knowledge, guideline uptake, and management adherence by clinicians and women.

NSS110

THE ROLE OF HORMONE THERAPY IN THE MANAGEMENT OF POSTMENOPAUSAL OSTEOPOROSIS

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Postmenopausal osteoporosis poses a significant global health challenge due to its association with increased fracture risk. Hormone therapy (HT) plays a key role in preventing and treating this condition by reducing bone mineral density (BMD) loss and fracture rates. This presentation examines HT's role in osteoporosis management, supported by key clinical studies and guidelines.

HT effectively prevents BMD loss and promotes bone mass gains. The PEPI trial confirmed its efficacy over three years, while long-term studies like the Nurses' Health Study and WHI trials demonstrated reduced fracture risks, including a 34% decrease in hip fractures with combined estrogen-progestogen therapy. Tibolone, a synthetic steroid, also prevents fractures in postmenopausal women, as shown in the LIFT trial. Early postmenopausal women with estrogen deficiency and high fracture risk benefit most from HT. Emerging evidence suggests that low and ultra-low estrogen doses are as effective in BMD maintenance as conventional doses, with fewer risks. This makes them a safer option for broader use.

Guidelines stress personalized HT use based on individual fracture risk, symptom severity, and patient preferences. The "window of opportunity" in early postmenopause maximizes skeletal and cardiovascular benefits while minimizing risks.

This presentation highlights HT as a pivotal tool for osteoporosis prevention and first-line treatment in symptomatic women at risk of fractures. By tailoring interventions, healthcare providers can optimize skeletal health and enhance quality of life for postmenopausal women.

NSS111

EVALUATION AND MANAGEMENT OF OSTEOPENIA AND OSTEOPOROSIS IN BREAST CANCER SURVIVORS

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Breast cancer is the most common cancer diagnosed in women worldwide. Due to earlier detection and advances in treatment, the 5-year survival rate in women with early breast cancer is currently greater than 90%, emphasizing the need to mitigate adverse long-term treatment effects. Patients with nonmetastatic cancer may be at risk for osteoporotic fractures due to baseline risks or due to the added risks associated with treatment-related bone loss

due to hypogonadism from endocrine therapy (ie, oophorectomy, GnRH agonists, chemotherapy-induced ovarian failure, aromatase inhibitors), chemotherapy or other cancer therapy associated medications (ie, glucocoriticoids). Osteoporosis fracture risk assessment may include use of FRAX or other established tools. For those patients with substantial risk of osteoporotic fracture, the clinician should obtain a bone mineral density test. The bone health of all patients may benefit from optimizing nutrition, increasing physical activity, strength training, training to prevent falls, smoking cessation and decreasing alcohol consumption. When a pharmacologic agent is indicated, bisphosphonates or denosumab at osteoporosis-indicated dosages are the preferred interventions. Bone-modifying agents (BMAs) are mainstays in breast cancer and prevent and treat osteoporosis in early-stage disease and reduce skeletal metastases complications in advanced disease. There is some evidence to support that BMA also prevents skeletal metastases and improves overall survival.

NSS112

WHY A CLINICAL PRACTICE GUIDELINE IN A MIDDLE-INCOME COUNTRY LIKE COLOMBIA?

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Colombia is a country known for its geographical, cultural, and biological diversity. With a growing economy and a diverse population, it has a health system that seeks to guarantee care for its entire population but faces challenges in efficiency and equity. Osteoporosis is a systemic skeletal disease characterized by low bone mineral density and deterioration of bone architecture, resulting in reduced bone strength and, consequently, increased susceptibility to fractures. In Colombia between 2012 and 2018, 249,803 of people over 50 years of age were diagnosed with osteoporosis. In 2015, the direct cost of hip fracture was estimated at USD 4,428.88 per event, USD 5,855.71 for surgical vertebral fracture and USD 1,196.65 for distal radius fracture. However, osteoporosis is not a disease prioritized in public policies, without specific primary prevention programs or a systematized registry of the disease. Understanding this scenario, it has been relevant to have guidelines that allow the approach of patients with osteoporosis, which is why the Colombian Association of Osteoporosis and Mineral Metabolism (ACOMM) developed in 2005 and 2018, two consensuses of experts in the diagnosis and treatment of osteoporosis. Due to the initial acceptance of the consensus and the evolution in the diagnosis and treatment of osteoporosis, the need arose for a Clinical Practice Guideline (CPG) that would synthesize the best available evidence, which would improve the diagnosis and treatment of affected patients, reduce the burden of osteoporosis on the health system and improve the quality of life of patients and their caregivers. Our CPG focuses on adult patients at risk or with primary osteoporosis. Developed by a multidisciplinary group of experts, it is aimed at all health professionals involved in the management of patients at risk of osteoporosis, suspected osteoporosis or confirmed diagnosis, at different levels of health care in Colombia.

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NSS113

CHALLENGES IN THE DEVELOPMENT OF CLINICAL PRACTICE GUIDELINES IN A MIDDLE-INCOME COUNTRY

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Clinical practice guidelines (CPGs) are considered an essential tool for physicians, policy makers and patients in disease management; however, there are limitations in the development of CPGs that affect all levels, mainly developing countries.

The validity of CPGs depends largely on evidence. The selection of studies based on content, quality, relevance and timeliness is key to avoid providing an erroneous recommendation, or one based on opinion. The difficulty in accessing scientific evidence or the misinterpretation of evidence also contributes to this problem.

Sometimes, the evidence that comes from developed countries cannot be adapted to some developing countries due to the lack of diagnostic methods or treatments, so the CPG must be adapted to the available resources, or it could not be applied, remaining far from the recommendations of international CPGs for the same disease.

There must be a careful selection of the panel of participants since there is usually unequal participation related to high workloads, lack of time, limited advice to the development group to choose the questions, methodology and schedule. Conflicts of interest (COI) of panel members developing CPGs must be disclosed, and while 78% of CPGs analyzed report COIs, most of them have financial ties to the industry, making recommendations less objective.

The costs to implement guidelines usually come from the government or scientific associations, which in low or middle-income countries are limited and CPGsdevelopment times can be extended.

Most CPGs are published in journals or on the websites of individual countries orhealth organizations, making them difficult for clinicians to access and implement. There are often no strategies or funding to disseminate them, and most guidelines

quickly become outdated after 3 years.
The Colombian Guide to Osteoporosis was advised by a group of epidemiologists and had the rigor of evidence and the participation of the panel, with financial resources from Colombian Osteoporosis and Mineral Metabolism Association (ACOMM).
Conclusion: The main challenges in the development of CPGs in low- and middle-income countries are adapting to the country's needs and resources, overcoming financing difficulties, conflicts of interest, dissemination and access.

NSS114

OPPORTUNITIES WITH THE DEVELOPMENT OF CLINICAL GUIDELINES

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Clinical practice guidelines (CPGs) are developed through a rigorous systematic methodology synthesizing the ever-increasing amounts of published literature into a practical and digestible set of clinical recommendations to be used in a healthcare setting. For a multidisciplinary scientific organization like Colombian Osteoporosis and Mineral Metabolism Association (ACOMM), the development of a Clinical Practice Guideline involves a effort that joint several of its active members with experience and knowledge , complementary to the topic of interest in question: rheumatology, endocrinology, geriatrics, gynecology and menopause, orthopedics, sports medicine , physiatry and family medicine.
The work carried out for the preparation of CPG, with a rigorous methodology and a large and enthusiastic participation, reflects ACOMM's commitment to health research and to the improvement of bone health in our country. Up to next some of the opportunities discovered with the development of clinical guidelines:
- Promote the growth and the visibility the ACOMM between Colombian academic, medical and policy members.
- Reduction of variability in clinical practice, especially in primary care to improve health outcomes with informed clinical decisions to the patients and their caregivers.
- Clinical guidelines could be adapted to meet the individual needs of patients and their specific health conditions because they can facilitate communication and collaboration between health professionals, including doctors, nurses and other specialists.
- Clinical guidelines could be integrated into clinical decision support systems and other technologies to improve their implementation and follow-up.
- Clinical guidelines can be the subject of continuous research and evaluation to improve their effectiveness and relevance.
In the experience of ACOMM, an expert consensus was developed and published in 2018, and it was taken as a basis for the elaboration of this new guideline. The association begun the dissemination by taking advantage of specific events and digital platforms that are ideal for carrying out activities around what is proposed in the guide.

NSS115

OSTEOPOROSIS AND THE SPINE OVERVIEW: KEY STATISTICS AND AN OVERVIEW OF THE NATIONAL SPINE HEALTH FOUNDATION'S KEY PATIENT AND HEALTH CARE PROFESSIONAL INITIATIVES

R. Roy[1]

[1]Chief Executive Officer, National Spine Health Foundation, Reston, United States

Dr. Roy will cover the following key topics:
- Provide an overview on the activities and key programs of the National Spine Health Foundation
- Fractures caused by osteoporosis most often occur in the spine (and in the United States, there are 1.5 million vertebral compression fractures that occur each year)
- The age- and sex-specific prevalence of osteoporosis in patients undergoing spine surgery goes up markedly as people age, particularly in females (from 27.8% for women from age 50-59 to 75.4% for women from age 70-79)
- The efforts that the National Spine Health Foundation is driving to educate patients and health care professionals on the need to identify, diagnose, and treat vertebral compression and spine fractures (both surgically and through anti-osteoporotic medications) including its patient and health care professional "Bone Hub" and medical education platform
- Key messages that are most effective with patients to educate them on the connection between spine and bone health (including prevention of osteoporosis, how it is treated, and why bone health is such an important component of spine health)

NSS116

A SPINE SURGEON PERSPECTIVE ON THE NEED FOR SPINE AND BONE HEALTH OPTIMIZATION

P. Anderson[1,2]

[1]University of Wisconsin School of Medicine, Madison, United States, [2]Co-Chair, National Spine Health Foundation Spine & Bone Health Task Force, Reston, United States

Dr. Anderson will cover the following key topics:
- Gaps in spine surgeon awareness of the need to conduct perioperative spine health optimization before surgery as a crucial step for improving patient outcomes and reducing complications (which includes a thorough bone health assessment) given the high prevalence of osteoporosis in patients undergoing spine surgery
- Why spine surgeons should establish care pathways to systematically identify and diagnose osteoporosis in their practices (which may include the establishment of a Fracture Liaison Service program or other means to ensure patients are assessed before surgery)

- The need for vertebral compression fractures to be treated as equally aggressively as hip fractures, with medications including anabolics
- Opportunities for spine/orthopaedic surgeons to work more effectively with bone health specialists to maximize patient care and improve outcomes
- NSHF's platforms to educate health care professionals on spine and bone health

NSS117

A EUROPEAN PERSPECTIVE ON KEY SPINE SURGEON GAPS IN THE DIAGNOSIS AND TREATMENT OF OSTEOPOROTIC PATIENTS

J. C. Le Huec[1,2]

[1]Member, National Spine Health Foundation European Spine & Bone Health Task Force, Reston, United States, [2]Polyclinique Bordeaux Nord Aquitaine and Bordeaux University, Bordeaux, France

Dr. Le Huec will cover the following key topics:

- Economic and personal impact of vertebral fractures across Europe
- NSHF's key activities regarding its European Task Force (building on the success of NSHF's activities in the United States)
- Opportunities for public and health care professional education in Europe regarding the connection between spine and bone health
- Integrating bone quality assessment into decision making and surgical planning in spine surgery
- How spine surgeons and bone specialists in Europe can more effectively work together to identify, diagnose, and treat patients with osteoporosis prior to spine surgery
- Guidance to national patient and health care professional groups on how to incorporate patient and health care professional messaging around spine and bone health

NSS118

SETTING THE STAGE: UNDERSTANDING THE INTERSECTION OF AGING, CKD, AND OSTEOPOROSIS – KEY CONCEPTS AND CLINICAL APPROACHES

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The aging process increases the risk of osteoporosis by decreasing bone density and deteriorating bone quality. This results in an increased risk of fractures, especially those that can lead to serious consequences such as hip fractures. CKD negatively affects bone health by affecting the body's mineral and bone metabolism. Individuals with CKD have a significantly increased risk of developing osteoporosis, especially in advanced stages. The bone disease associated with CKD is called "CKD-mineral and bone disease (CKD-MBD)" and is characterized by weakened bones, pain, and an increased risk of fractures. When aging and CKD come together, bone loss and the risk of fractures increase even further. This makes early diagnosis and treatment of osteoporosis critical in older CKD patients. Effective management of this triad of health problems requires a multidisciplinary approach. Lifestyle changes (regular exercise, balanced diet, fall prevention), medication therapies, and regular follow-up are important to maintain bone health and reduce the risk of fractures.

NSS119

MANAGING SKELETAL FRAGILITY IN THE CONTEXT OF CKD: PRACTICAL INSIGHTS

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Chronic kidney disease (CKD) is associated with the development of a mineral bone disorder (CKD-MBD). CKD-MBD is a systemic disorder which is manifested by either one or a combination of the following: abnormalities of calcium, phosphorus, parathyroid hormone, or vitamin D metabolism; abnormalities in bone turnover, mineralization, volume, linear growth, or strength; vascular or other soft tissue calcification. Persons with CKD have an increased risk of fracture compared to those with normal renal function, and this risk is elevated further in those who are on dialysis. There is also a greater risk of morbidity and mortality.
Dual energy X-ray absorptiometry (DXA) should be used to assess fracture risk in persons aged > 50 years and with CKD 4-5D. DXA may, however, underestimate the actual fracture risk as it does not account for impaired bone quality. Fracture risk will also be affected by the severity of CKD and the duration of dialysis. Ongoing studies are assessing whether arithmetic adjustment for bone quality (i.e. using trabecular bone score), non-kidney retained bone turnover markers, or CKD severity, may improve the fracture risk prediction.
Non-pharmacological interventions include ensuring an adequate dietary intake of calcium and vitamin D stores being replete. Persons with CKD are at increased risk of falls, and exercises should be targeted to improve muscle strength and balance.Pharmacological therapies include antiresorptive and osteoanabolic Most clinical trials of antiresorptive medications have excluded patients with advanced CKD, but the available data are most extensive for bisphosphonates. Subgroup analyses of phase 3 trials have suggested therapeutic benefits of bisphosphonates in patients with CKD 1-3b, as well as in patients who have undergone kidney transplantation, although data on bisphosphonates in CKD 4-5D are extremely limited. Denosumab is a drug with antiresorptive properties that can be used in the treatment of osteoporosis in advanced CKD with less risk of renal toxicity. There is, however, risk of severe hypocalcaemia, which can be prolonged and is more common in patients with advanced CKD and on dialysis. In addition, if Denosumab is stopped with

no follow-on treatment, there is an increased risk of rebound osteoclast activity, a rapid reduction in bone mass and an increased risk of vertebral fractures. Although bisphosphonates may negate this, their use may be precluded in patients with CKD. Low bone turnover is commonly observed in patients with advanced CKD or maintenance dialysis, suggesting that osteoanabolic drugs may play an important role. These drugs include Abaloparatide, Teriparatide and Romosozumab, although there are limited studies that have assessed the use of these in CKD patients. At the end of the course of anabolic treatment, it is generally recommended to have follow-on treatment with an anti-resorptive and this choice may be challenging in patients with advanced CKD. In addition, the increased prevalence of cardiovascular disease in CKD patients may limit the use of Romosozumab. Further studies are needed to explore the safety and efficacy of these drugs for treating CKD-MBD.

NSS120

REAL-WORLD CHALLENGES AND PERSONALIZED STRATEGIES IN DIAGNOSIS AND TREATMENT

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While management of OP is well-defined in guidelines, management and treatment decisions in older complex patients having CKD-MBD and osteoporosis are still challenging. The presentation will include a brief summary of a series of 20 cases with OP and CKD-mineral and bone disorder (MBD) managed by Istanbul Bone and Musculoskeletal Health Consortium. Afterwards, we will focus on a selected case illustrating the need for personalized strategies. Attendees are aimed to gain insights and practical tools to address these complex scenarios effectively.

NSS121

HIV AND IT'S TREATMENTS ON FRACTURE RISK: A SCOPING REVIEW

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[1]The Health Research Unit of Zimbabwe (THRU ZIM), The Biomedical Research and Training Institute, Harare, Zimbabwe, [2]Global Health & Ageing Research Unit | Musculoskeletal Research Unit, Bristol Medical School, University of Bristol, Bristol, United Kingdom

We will outline findings from a recently completed WHO-commissioned scoping review, on incidence, prevalence, risk factors and prevention of fractures in adults living with HIV in low- and middle-income countries (LMIC), which has identified gaps in the evidence-base, on which to focus in future research programmes. Findings include the evidence for PrEP (pre-exposure prophylaxis) and the association with fracture.

NSS122

FRACTURES E3 FOCUSSING ON VERTEBRAL FRACTURES

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To understand the epidemiology of vertebral fractures across Africa, we conducted a community-based prevalence study in The Gambia (urban and rural), South Africa (urban and rural) and Zimbabwe (peri-urban), using iDXA VFA and plain lateral radiographs where iDXA VFA was not available. We recruited 5050 adults age 40 years and older (51% female). Vertebral fracture prevalence, in men and women age 40-54 years was 2-5% and 1-3% respectively, whilst in those age 55-70 years it was 5-7% and 4-9%, and in the older group age 70+ years it was 6-15% and 7-21%. Age, low BMD, glucocorticoid use we strongly associated with VF. In Zimbabwe HIV was associated with prior VF. Overall, prevalence was similar to many European estimates, and as seen elsewhere was associated with back pain. Notably, no individual was taking anti-resorptive medication. We will describe work underway to use these data to aid clinical fracture risk assessment approaches.

NSS123

CLINICAL RISK FACTORS ASSOCIATED WITH FRACTURE RISK IN MIDDLE-AGED MEN AND WOMEN FROM SOWETO, JOHANNESBURG: FINDINGS FROM THE MIDDLE-AGED SOWETO COHORT (MASC)

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Data from the MASC cohort has reported a prevalence of osteoporosis (lumbar spine or total hip) of 25% and 15.7% in women living with HIV and HIV-negative women, respectively. Our longitudinal data have also shown greater menopause-associated bone loss in women living with HIV compared to HIV-negative women; however, it is unknown whether these differences translate to fracture risk, and the fracture risk in South African men of the same age.

We will describe data collected at the most recent time point (2023/2024) from 600 men and women from the MASC cohort and how it has been used to estimate the 10-year probability of a major osteoporotic fracture (MOF) using the South African FRAX tool. We will quantify associations between clinical risk factors such as age, weight, height, smoking status, alcohol consumption, HIV infection, prior fracture, and 10-year probability of MOF in men and women living with and without HIV.

These findings will provide much-needed data on factors associated with fracture risk in an under-represented population who may be at higher risk of osteoporosis and fracture than previously thought.

NSS124

THE INFLUENCE OF HIV ON BONE QUALITY, QUANTITY AND FRACTURE RISK IN MIDLIFE WOMEN: FINDINGS FROM A CROSS-SECTIONAL STUDY IN ZIMBABWE

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To investigate the effects of HIV on bone health in menopause we conducted a cross-sectional study of women aged 40-60 years (49% with HIV) in Harare, Zimbabwe. We quantified BMD using radial/tibial peripheral Quantitative Computed Tomography (pQCT) scans and DXA, and prior fracture to determine FRAX probabilities of major osteoporotic fracture (MOF).

The 393 women had a mean (SD) age of 49.6 (5.8) years and mean (SD) BMI of 29.1 (6.0) kg/m2. 95% of those with HIV were established on antiretroviral therapy (ART) (85% on tenofovir disoproxil fumarate) and 81% had a viral load <50 copies/mL. BMD T-score ≤ -2.5 was more commonly seen in women living with HIV (WLH) than those without, at both femoral neck (FN) and lumbar spine (LS) (FN, 22 [11.4%] vs 5 [2.5%]; LS, 40 [20.8%] vs 9 [4.5%], respectively). Prior fracture was more prevalent in WLH (any fracture: 27 [14%] vs 14 [7%]); MOF: (14 [7.3%] vs 5 [2.5%]). Nobody reported anti-osteoporosis medication use. Older age, low weight, and HIV infection were strongly associated with lower FN BMD. WLH had a higher 10-year MOF probability, although probabilities were low.

WLH had lower absolute pQCT measures at all sites. Overall, HIV-related deficits were robust to adjustment for age, menopause status, height, and fat mass: WLH had lower trabecular vBMD (radius -7.3 [-12.5; -2.0]%, tibia -5.4 [-9.1; -1.7]%), and cortical vBMD (radius -3.5 [-5.9; -1.1]%, tibia -1.1[-1.6; -0.5]%). Strength estimates were lower in WLH at both radius and tibia. Longer HIV duration was associated with lower radius bone area, BMC, estimates of bone strength, independent of ART duration.

We found that osteoporosis and previous fractures were common and untreated in this relatively young population, particularly in women living with HIV. Trabecular deficits predominate in those women. FRAX-probabilities were low. The approach to consider clinical risk factors in fracture risk prediction tools may need contextual adaptation.

NSS125

EXPLORING THE ROLE OF INFLAMMAGEING IN SARCOPENIA – A QUICK OVERVIEW

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Sarcopenia is a muscle disease, characterized by loss of muscle mass and function, leading to 'muscle failure'. It is highly prevalent amongst older adults and can seriously affect the daily life of an older adult, e.g., by limiting the ability to walk and to lift heavy objects like groceries or through difficulties to climb the stairs. One of the major mechanisms behind the onset and progression of sarcopenia is the **chronic low grade inflammatory state related with ageing**, the so-called 'inflammageing'. The concept of inflammageing was originally introduced by Franceschi *et al.* in 2000 and is presumed to play a major role in many age-related diseases, e.g., dementia, cancer, atherosclerosis. However, the

exact mechanisms by which inflammageing causes sarcopenia are not completely clear yet.
Over the past decades, research into the interplay between inflammageing and sarcopenia has increased, with numerous cytokines (e.g., Interleukin-6, Tumor Necrosis Factor-α, IL-1β, and others) being investigated in this context. The growing body of findings is complex and at times contradictory. However, there is accumulating evidence supporting the role of inflammageing as a key driver in the development of sarcopenia, highlighting its potential as a target for therapeutic interventions aimed at counteracting the condition.
This presentation will discuss available data from the **Exercise and Nutrition for Healthy AgeiNg (ENHANce)** study, examining the inflammatory profiles of sarcopenic older adults and their association with functional outcomes (1). Additionally, findings from **the European Male Ageing Study (EMAS)** will be presented, exploring the relationship between inflammatory markers (hs-CRP, WBC, and albumin) and sarcopenia or related traits in middle-aged and older men (2). Finally, **recent advances** in understanding the connection between sarcopenia and inflammageing will be discussed.
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NSS126

THE GUT-MUSCLE AXIS IN SARCOPENIA: BRIDGING GUT MICROBIOTA, INFLAMMATION AND DIET

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Sarcopenia, the age-related loss of muscle mass and function, increases the risk of deleterious health outcomes in older populations. Thus, timely diagnosis and treatment optimization for sarcopenia are warranted, which could be attained through in depth insights in its pathophysiology. Multiple factors contribute to sarcopenia (such as chronic low-grade systemic inflammation, anabolic resistance, oxidative stress and habitual dietary intake void of proteins). Additionally, over the past decade, a novel driving mechanism has emerged, namely the gut microbiota (GM) acting through a **gut-muscle axis.**
Healthy GM modulate physiological processes such as gut barrier integrity, suppression of chronic inflammation and enhancement of antioxidative activity, of which some processes are linked to sarcopenia pathophysiology. Thus altered, dysbiotic GM enhance chronic low-grade systemic inflammation, eventually impacting skeletal muscle. Prior research has linked a dysbiotic GM to low muscle mass and function in persons with underlying comorbidity. However, data on the link in primary sarcopenia, when only aging is the evident trigger, is scarce, hampering identification of a **GM signature** of sarcopenia.
Additionally, identification of a GM signature or a surrogate thereof, may be a valuable **diagnostic biomarker** in sarcopenia. Previously, it has been shown that the **intestinal inflammatory marker fecal calprotectin (fCPT)** strongly correlates with dysbiotic GM in persons with Inflammatory Bowel Disease. However, fCPT's potential value as surrogate for GM dysbiosis in sarcopenia diagnosis, has not been investigated.
Currently, non-pharmacological anabolic interventions, such as high-protein diets, are the preferred treatment option for sarcopenia. However, in turn, these high-protein diets do not necessarily beneficially impact GM composition. Furthermore, prior research has investigated effects of interventions restoring dysbiotic GM, such as pre-, pro or symbiotic supplementation on muscle mass, strength. However, these studies often neglected the role of the habitual diet, although known to be a GM modulator.
To address these remaining research gaps, in this symposium we will elaborate upon:
1. Whether there is evidence for the existence of a specific GM signature for sarcopenia, investigating possible associations between specific GM taxa and sarcopenia (-defining parameters).
2. Investigating the value of the gut dysbiosis surrogate fCPT as a biomarker for sarcopenia, alone or in combination with other biomarkers.
3. How GM-altering interventions, such as diet, pre-pro and synbiotics, impact sarcopenia (-defining parameters).
We will present recent findings from a systematic review, meta-analysis and the ongoing Trial in Elderly with Musculoskeletal Problems due to Underlying Sarcopenia – Faeces to Unravel the Gut and Inflammation Translationally (TEMPUS-FUGIT; NCT05008770) to address the above-mentioned gaps.
References:
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NSS127

SARCOPENIA AND THE BRAIN: UNRAVELLING THE MUSCLE-BRAIN AXIS IN THE DEVELOPMENT AND TREATMENT OF SARCOPENIA

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Due to the ageing society, preventing or treating age-related disabilities or diseases is one of the most important public health objectives of this century. Two common key features of the ageing process are **age-related sarcopenia and cognitive decline.**
Emerging research indicates a **potential link between sarcopenia and cognitive decline**, including mild cognitive impairment, Alzheimer's disease and other types of dementia. However, there is paucity of data on the (temporal) association between sarcopenia and its defining parameters (muscle mass, strength and physical performance) and different domains of cognitive functioning. Moreover, preclinical studies suggest that **myokines** could serve as a key molecular mechanism in explaining this relationship, though clinical data remains scarce.
Evidence also indicates that both sarcopenia and cognitive decline may be preventable and reversible by addressing common modifiable risk factors, such as nutritional status and physical exercise. Promising data indicate that resistance exercise training and protein supplementation, can improve sarcopenia and prevent cognitive decline. However, it remains unclear whether combining exercise with protein supplements or omega-3 supplements is more effective than exercise alone for improving both sarcopenia outcomes and cognition.
In this lecture, we will:

- Discuss recent developments in the interrelationship between sarcopenia and cognition, and the potential role of myokines in the muscle-brain axis.
- Discuss whether interventions aimed at improving sarcopenia outcomes, may also have beneficial effects on cognitive functioning in older adults.

We will present recent findings from the Exercise and Nutrition for Healthy AgeiNg (ENHANce) study, a 5-armed triple blinded RCT, in sarcopenic older adults (≥65 years), that aims to assess the effect of combined anabolic interventions (protein supplement, omega-3 supplement and physical exercise) on both physical performance and cognitive performance during a 12-week intervention.References:

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NSS128

FIBROMYALGIA AS A SYSTEMIC AUTOIMMUNE DISEASE AFFECTING THE BONE

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Fibromyalgia is a syndrome of persistent widespread pain, stiffness, fatigue, disrupted and unrefreshing sleep, and cognitive difficulties, often accompanied by multiple other unexplained symptoms, anxiety and/or depression, and functional impairment of activities of daily living. It typically presents in young or middle-aged women, but it can affect patients of both sexes and of any age. Fibromyalgia has psychological implications. Basic and clinical investigations have clarified the neurophysiologic basis for fibromyalgia and led to its current classification as a central sensitivity syndrome. It may be considered as a neurosensory disorder characterized in part by abnormalities in pain processing by the central nervous system. Increased understanding of the pathophysiology of fibromyalgia may lead to novel therapeutic advances for the management of the disorder. The disorder is now considered an autoimmune disorder possibly characterized by autoimmunity against the autonomous nervous system. Fibromyalgia affects all organ systems including the musculoskeletal system, which is deeply affected.

NSS129

FIBROMYALGIA IN THE CONTEXT OF AUTOIMMUNE RHEUMATIC DISEASES

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Fibromyalgia, a syndrome of persistent widespread pain, stiffness, fatigue, disrupted and unrefreshing sleep, and cognitive difficulties, anxiety, depression, and functional impairment of activities of daily living may occur as a primary disorder in its own right or may occur in the context of systemic autoimmune rheumatic diseases. The presence of fibromyalgia in the context of autoimmune rheumatic disorders, such as systemic lupus erythematosus, rheumatoid arthritis or psoriatic arthritis may aggravate pain and may lead to a severe phenotype of the primary disease. The presence of fibromyalgia in the context of autoimmune rheumatic diseases may lead to difficulties in the management of the diseases as well as to the management of

pain in these affected patients. The presence of fibromyalgia and the associated pain leads to a vicious cycle, aggravates symptoms of the underlying disease and further affects quality of life.

NSS130
FIBROMYALGIA IN THE CONTEXT OF AUTOIMMUNE THYROID DISEASE

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Fibromyalgia and chronic widespread pain syndromes are among the commonest diseases seen in rheumatology practice. Autoimmune thyroid diseases are common widely prevalent autoimmune disorders and are associated with fibromyalgia and chronic pain. This association is a manifestation of the autoimmune origin of fibromyalgia. It appears that mechanisms of pain related to fibromyalgia and autoimmune thyroid disease are inflammatory mediators, small-fiber neuropathy and central sensitization. The elucidation of pain pathways leads to the application of modern therapeutic agents in the management of pain in thyroid autoimmune disorders. The association of fibromyalgia with thyroid autoimmunity further underscores the autoimmune pathophysiology of fibromyalgia and leads to progress in the elucidation of the origin of chronic pain syndromes.

NSS131
FIBROMYALGIA AND PAIN

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Fibromyalgia is a systemic disease which is characterized by chronic pain. Fibromyalgia may occur as a primary disorder or may accompany autoimmune rheumatic diseases. Pain affecting the musculoskeletal system is a main manifestation of fibromyalgia. It is currently thought that fibromyalgia has autoimmune pathophysiology. Therefore, it is thought that molecular pathways related to autoimmunity and inflammation may be responsible for chronic pain, in particular musculoskeletal pain. These recent advances in the elucidation of the pathogenesis of fibromyalgia may lead to therapeutic advances in the management of the disease and in particular in the successful management of pain.

NSS132
FIBROMYALGIA, PAIN AND PSYCHOLOGICAL IMPLICATIONS

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Fibromyalgia is a systemic disorder characterized by chronic pain. The disorder may accompany systemic autoimmune rheumatic disorders or may occur as a primary disorder. Fibromyalgia has psychiatric and psychological manifestations such as anxiety and depression. The recent research findings which underline the autoimmune origin and pathophysiology of fibromyalgia further underline the close relationship between autoimmunity and depression. These clinical observations have led to novel therapeutic advancements in the management of pain in the context of fibromyalgia with antidepressive agents. It appears that fibromyalgia is a model disease delineating the relationship of pain and in particular musculoskeletal pain with depression and anxiety and may lead to the elucidation of the pathophysiology of chronic pain.

NSS133
DENOSUMAB: LONG-TERM THERAPY AND DISCONTINUATION

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Denosumab is a potent anti-remodeling drug used for the treatment of men and postmenopausal women with osteoporosis and for men and women receiving hormone ablative therapy for non-metastatic prostate and breast cancer. Therapy for 10 years in women with postmenopausal osteoporosis resulted in continued increase in hip bone mineral density (BMD) and persistent or improved reductions in fracture risk. (1) No duration-related adverse events were observed. These findings make denosumab an attractive therapy for the long-term management of patients with osteoporosis. However, in contrast to our experience with bisphosphonates, the discontinuation of denosumab results in a rebound in markers of bone resorption, rapid loss of BMD and vertebral fracture protection and an increased risk of rebound-associated multiple vertebral fractures. (2)These changes have been observed upon discontinuation of denosumab when used for the treatment of osteoporosis in men and postmenopausal women, of glucocorticoid-induced osteoporosis, and to maintain bone health in men or women with non-metastatic cancer receiving hormone ablative therapy. For all patients who discontinue denosumab, regardless of treatment indication, a plan of assessment and management is required to maintain the benefits of the denosumab therapy and to prevent potentially serious consequences of the post-therapy rebound in remodeling.

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NSS134

MANAGING DENOSUMAB DISCONTINUATION IN PATIENTS WITH OSTEOPOROSIS

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Denosumab treatment leads to a sustained suppression of bone turnover and continuous increase of bone mineral density (BMD) long-term. Upon discontinuation of denosumab a transient overshoot in bone turnover and rapid bone loss occurs. The most plausible mechanism is the accumulation of precursor and recycled osteoclasts that synchronously differentiate when RANKL is no more inhibited, resulting in transient uncoupling with high bone resorption and low osteoblastic activity with low OPG levels. Determinants of greater bone loss with denosumab discontinuation include higher baseline CTX levels, longer denosumab treatment duration, younger age, low BMI and no prior antiresorptive treatment.

The rebound after short-term denosumab treatment (<3 yrs) may be mitigated by oral bisphosphonates, but more certainly by a single zoledronate infusion. The rebound after longer-term denosumab treatment is more difficult to completely overcome. The best proved strategy is multiple infusions of zoledronate during the first 1-2 years after discontinuation, guided by maintaining p-CTX below the premenopausal mean. (1,2) Studies investigating a strategy involving gradual reduction in denosumab doses are ongoing.

After more than 10 years of clinical experience, the efficacy and safety of denosumab in the treatment of post-menopausal osteoporosis is well established. However, preventing the bone turnover overshoot and bone loss related to denosumab withdrawal has emerged as a new challenge. Clinical trials and observational studies have demonstrated that the bone loss and risk of vertebral fractures when discontinuing denosumab can be mitigated by zoledronate, often requiring multiple infusions within the first year.

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NSS135

MANAGING THE DISCONTINUATION OF DENOSUMAB IN PATIENTS ON HORMONE ABLATIVE THERAPY FOR NON-METASTATIC CANCER WITH OSTEOPOROSIS

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Denosumab, a key antiresorptive for postmenopausal osteoporosis, reduces fracture risk by 50% in women on aromatase inhibitor (AI) therapy and is often recommended for its efficacy, ease of use, and tolerance. Spontaneous multiple vertebral fractures (MVFs) after denosumab discontinuation, known as rebound-associated vertebral fractures (RAVFs), have led medical societies to recommend follow-up antiresorptive treatment in postmenopausal osteoporosis.(1) Postmenopausal patients with endocrine-responsive breast cancer treated with adjuvant AIs who stopped denosumab had a significantly higher risk of developing clinical vertebral fractures (hazard ratio [HR] = 2.44; 95% CI = 1.12–5.32) and MVFs (HR = 3.52; 95% CI = 0.98–12.64) compared to patients who stopped placebo. However, this increased risk was only observed in patients who ended AI treatment prior to or more than 6 months after the last dose of denosumab, whereas no difference was seen in those who ended AI treatment within 6 months of stopping denosumab.(2) The use of denosumab often aligns with cancer treatment, requiring careful consideration of alternative antiresorptive therapies or strategies to maintain bone health when discontinuing denosumab.(3)

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NSS136

EPIDEMIOLOGICAL FACTS ABOUT OSTEOSARCOPENIA

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Osteosarcopenia, a geriatric syndrome characterized by concurrent declines in bone density (osteopenia or osteoporosis) and skeletal muscle mass and strength (sarcopenia), poses significant challenges for aging populations. Its dual pathology amplifies the risk of adverse outcomes, including fractures, disability, and mortality, making it a pressing concern in clinical practice. Prevalence estimates vary widely, from 5% to 37%, depending on diagnostic criteria, population demographics, and assessment methods. Osteosarcopenia is more common in postmenopausal women due to hormonal changes but is also increasingly recognized in aging men. The negative consequences of osteosarcopenia are profound, primarily due to the synergistic effects of compromised bone and muscle integrity. The condition significantly increases fracture risk, especially at the hip, spine, and wrist, due to poor bone strength and an increased likelihood of falls. Fractures in osteosarcopenic individuals are associated with prolonged hospitalization, impaired recovery, and functional decline, which collectively elevate the risk of dependency and institutionalization. Moreover, osteosarcopenia is strongly linked to increased mortality. Studies show that individuals with combined osteoporosis and sarcopenia have a higher mortality risk than those with either condition alone. Mechanistically, this elevated risk stems from fracture-related complications, systemic inflammation, and reduced physical activity, which contribute to cardiovascular and metabolic deterioration. Physicians must recognize osteosarcopenia as a significant predictor of mortality and morbidity. Early identification and multifaceted interventions can mitigate these adverse outcomes, improving both longevity and quality of life for affected patients.

NSS137

THE MOLECULAR PATHWAYS OF OSTEOSARCOPENIA

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Osteosarcopenia, the concurrent decline of bone and muscle mass and function, represents a burgeoning challenge in aging populations worldwide. This symposium will explore the intricate pathophysiological mechanisms underpinning this syndrome, highlighting the interconnected nature of skeletal and muscular systems. Key topics will include the role of inflammatory pathways, hormonal dysregulation, mitochondrial dysfunction, and the impact of mechanical loading on musculoskeletal health. Cutting-edge research on the contribution of bone-muscle crosstalk through myokines and osteokines will be presented, alongside the influence of nutritional deficits, physical inactivity, and systemic diseases.

By examining the shared and distinct etiological factors of osteoporosis and sarcopenia, this symposium aims to provide a comprehensive understanding of the biological underpinnings of osteosarcopenia and its clinical implications. The session will conclude with an overview of emerging therapeutic approaches, from pharmacological interventions to tailored exercise and dietary strategies, aimed at mitigating the functional and metabolic consequences of this syndrome. Attendees will gain insight into translational opportunities for advancing prevention and treatment to improve the quality of life and functional independence of aging individuals.

NSS138

HOW TO TREAT OSTEOSARCOPENIA

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Osteosarcopenia, a clinical condition characterized by the concomitant presence of osteoporosis and sarcopenia, poses a significant challenge to aging populations. This dual impairment in bone density and muscle mass or function increases the risk of fractures, disability, and mortality, necessitating an integrated and multidisciplinary therapeutic approach. Effective management focuses on addressing the shared pathophysiological mechanisms of osteosarcopenia, including chronic inflammation, hormonal decline, and nutritional deficiencies.Nutritional interventions are of importance, emphasizing adequate protein intake (1.0–1.5 g/kg/day), vitamin D optimization, and calcium supplementation. Emerging evidence supports the role of omega-3 fatty acids and other micronutrients, such as magnesium and vitamin K2, in promoting musculoskeletal health. Resistance and weight-bearing exercises are essential, as they stimulate muscle hypertrophy and enhance bone remodeling. Tailored exercise programs combining strength, balance, and aerobic training improve physical performance and reduce fall risk.Pharmacological strategies target bone loss and muscle function. Bisphosphonates, denosumab, or anabolic agents like teriparatide are indicated for osteoporosis, while selective androgen receptor modulators (SARMs) and myostatin inhibitors are under investigation for sarcopenia. Hormone replacement therapy may benefit postmenopausal women with severe osteosarcopenia. Additionally, sarcopenia-specific pharmacotherapies, such as acetylcholinesterase inhibitors, are gaining attention.Comprehensive management incorporates lifestyle modifications, fall prevention, and regular monitoring to tailor interventions. Early diagnosis and treatment are pivotal in mitigating the synergistic effects of osteosarcopenia on morbidity

and improving patient outcomes. This talk underscores the need for personalized, multidisciplinary strategies to optimize care in this vulnerable population.

NSS139

THE LATAM PAG MATERIALS AND METHODS

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In the past years, several bone-related organizations have explored patients' perceptions, behaviors, and expectations through surveys and patient group discussions. IOF in collaboration with medical societies in Argentina, Brazil, Colombia, Mexico, Panama and Peru set a patient group and carried out a study with the aim of understanding the perception of patients with bone fragility to better understand their osteoporosis diagnosis and treatment pathways as well as assess their information needs.
To this purpose a convenience sample of 20 patients from the six different Latin American countries listed above constituted a focal group. All participants have been diagnosed with osteoporosis and already in treatment at various stages of OP. The study was conducted in two phases: the first phase involved a cross-sectional survey using an instrument developed by the IOF which was modified to meet LATAM needs, and the second phase consisted of a focus group conducted in a hybrid format.

NSS140

KEY FINDINGS AND RESULTS

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Both phases of the study gathered relevant information related to the patients' diagnosis and treatment journeys and their perceptions towards the disease. All 20 patients in the sample were diagnosed with osteoporosis by a specialist, either gynecolgist or endocrinologist for more than three years and since then received anti osteoporosis medication. Average time to treatment was reported between 0 to 2 months, and a very low percentage (less than 5%) have interrupted treatment.
Patients indicated a high level of trust in their treating physician, who provided them with relevant information about bone friendly lifestyle. Pharmaceutical companies were also ranked with a high level of confidence by a large percentage of the individuals in the sample (65%). Media and influencers were rated as highly unreliable by the majority of the LATAM group of patients.
During the focal session, patients provided more insight about their journey. Patients shared in first person the different access to diagnosis and treatment a person in risk of osteoporosis experienced at a public vs a private healthcare institution: longer waiting time to get a doctor's appointment, limited access to diagnosis methods and treatment options to name the most relevant ones.
This group of patients showed a significant knowledge about osteoprosis, bone health and sources of information, specifically related to osteoporosis, treatment benefits and potential drug side effects. Own treating physician was rated high as a trustable source of information, in opposition to media and influencers.
Finally, the LATAM patients' group addressed how osteoporosis impacted their daily life. However, none of the participants reported a significant impact of osteoporosis in their quality of life, they all shared great fear about the future. And, even under treatment, they expressed deep concern about falls and loss of independence due to bone fragility.

NSS141

LISTENING TO THE PATIENT'S VOICE

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I want to shed light on the lived experience of being diagnosed with primary osteoporosis and categorized as being at a very high fracture risk. It captures the emotional and practical journey from diagnosis to treatment and highlights patients' unique daily challenges.
This journey began with the shock and uncertainty that accompany an osteoporosis diagnosis, being a young, previously healthy man working as an orthopedic surgeon treating fragility fracture patients.
For many, as for me, this news felt like an abrupt loss of vitality, lifespan, and independence, shadowed by fears of fractures and their consequences. The doubts are immediate: *What does this mean for my future? Will I still be able to do the things I love? For how long will I still be able to work?* I found myself wrapped up in an overwhelming amount of information, unclear prognoses, and conflicting advice about my lifestyle and activities.
Finding a secondary cause was a long way of forbearance, uncertainty, hope, and fear. On the one, you could bump into something bigger, but at the same time, you might find the cause and the solution for osteoporosis. After an expensive and time-consuming journey that left me with a diagnosis of primary osteoporosis, it was a necessary journey that allowed me to realize the true rival I was facing.
Daily living becomes a careful negotiation. Many healthcare professionals, relatives, colleagues, and self-driven insights come along with how you should or must adapt your life to minimize fracture risk, avoiding activities that were once routine or joyful. There is a persistent uncertainty about what is allowed and what is not: *Which type of exercise? Is a high-calcium diet enough? What if I fall during house chores? Am I able to carry my child? How much axial weight is too much?* This cautious existence often leads to a sense of loss of independence and diminished quality of life. Also, you find out the lack of evidence-based information to solve these questions. And how vague our current patients' lifestyle recommendations are.
Pharmacological treatment brings its own set of concerns.

Including navigating the fear of different side effects, from discomforts to rare but severe complications. Also, I asked myself questions about the long-term efficacy and safety of the prescribed medications. The sense of vulnerability deepens when side effects materialize in some of my own patients, creating a complex balancing act between the necessity of treatment and its physical toll. That made me wait for the initiation of treatment for almost a year.

Another critical dimension of the discussion addresses systemic issues in the healthcare and community landscape. We often lack empathetic communication with our patients, leaving them feeling unheard and unsupported. The need for greater understanding, reassurance, and tailored guidance is palpable. Moreover, the absence of robust patient communities exacerbates feelings of loneliness and a self-driven lifestyle. Peer support is a missing pillar in coping with osteoporosis, depriving patients of shared experiences and encouragement.

Practical barriers, such as the scarcity of osteoporosis-friendly exercise spaces and knowledge professionals, further hinder patients' ability to maintain bone health and physical activity. Accessible, safe environments where individuals can engage in weight-bearing and balanced exercises are urgently needed but remain elusive in many regions.

This experience was a call to action for a more patient-centered approach to managing osteoporosis. We need to build a vast, open, and strong communication between patients and healthcare providers, fostering supportive communities and addressing the practical gaps in daily living. By enhancing empathy and systemic support, the journey with osteoporosis can shift from one defined by fear and restrictions, underscoring the need for holistic care to one of empowerment and proactive care, taking care not just of the patient's bones but the person as a whole.

NSS142

EXERCISE IN OSTEOPOROSIS

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Osteoporosis is a prevalent condition characterized by decreased bone mass and deterioration of bone tissue, leading to increased fragility and a higher risk of fractures. Exercise plays a pivotal role in the management and prevention of osteoporosis by enhancing bone health, improving muscle strength, and reducing fall risk. This abstract explores the types, benefits, and mechanisms of exercise in addressing osteoporosis. Weight-bearing aerobic exercises, such as walking, jogging, and dancing, stimulate osteogenesis by promoting mechanical loading on bones. Resistance training, including the use of weights or resistance bands, further strengthens the musculoskeletal system by improving bone mineral density (BMD) and muscle mass. Balance and flexibility exercises, such as yoga and tai chi, contribute to fall prevention by enhancing proprioception and reducing postural instability. The efficacy of exercise in osteoporosis is influenced by factors such as intensity, frequency, and duration. High-impact activities are particularly effective for younger individuals in maintaining bone density, while low-impact and modified exercises are recommended for older adults and those with advanced osteoporosis to minimize fracture risk. Personalized exercise programs, tailored to the patient's age, fitness level, and medical history, are critical for safety and optimal outcomes.

Regular physical activity not only addresses the skeletal aspects of osteoporosis but also improves cardiovascular health, mental well-being, and overall quality of life. This underscores the importance of integrating exercise into comprehensive osteoporosis management strategies. Future research should focus on elucidating the long-term effects of various exercise regimens and optimizing intervention protocols for diverse patient populations.

NSS143

PHYSICAL THERAPY MODALITIES IN OSTEOPOROSIS AND ITS COMPLICATIONS

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Osteoporosis is a systemic skeletal disorder characterized by reduced bone mineral density (BMD) and microarchitectural deterioration, leading to increased fracture risk. Physical therapy modalities are integral to managing osteoporosis and addressing its complications, such as fractures, chronic pain, and reduced mobility. This abstract reviews the role and effectiveness of various physical therapy interventions in improving patient outcomes in osteoporosis. Physical therapy modalities encompass a range of approaches, including therapeutic exercises, electrotherapy, manual therapy, and patient education. Low-intensity pulsed ultrasound (LIPUS) and electrical stimulation have shown potential in promoting bone healing and improving BMD in individuals with fractures. Heat and cold therapies are employed to manage pain and inflammation associated with acute and chronic musculoskeletal complications. Manual therapy techniques and soft tissue mobilization can address musculoskeletal imbalances and improve joint mobility, particularly in patients with vertebral fractures. Patient education on posture correction, body mechanics, and lifestyle modifications complements the physical therapy regimen. Kinesio taping can also be used in posture correction,

The effectiveness of physical therapy modalities in osteoporosis is highly dependent on individualized treatment plans that consider patient age, comorbidities, fracture history, and functional status. Integration of physical therapy into a multidisciplinary approach can significantly improve quality of life and mitigate the complications of osteoporosis. Future research should aim to refine physical therapy protocols and explore novel modalities to enhance bone health and functional outcomes in this population.

NSS144

MICROBIOTA AND DIET IN OSTEOPOROSIS

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Emerging research highlights the critical role of the gut microbiota and dietary factors in the pathogenesis and management of osteoporosis. Osteoporosis, characterized by decreased bone mineral density (BMD) and increased fracture risk, is influenced not only by hormonal, genetic, and lifestyle factors but also by gut health. This abstract explores the interplay between microbiota, diet, and bone health, offering insights into novel therapeutic strategies. The gut microbiota modulates bone health through mechanisms such as the regulation of calcium and vitamin D absorption, production of short-chain fatty acids (SCFAs), and modulation of systemic inflammation. Dysbiosis, characterized by an imbalance in gut microbial composition, has been associated with increased bone resorption and impaired bone formation. Factors contributing to dysbiosis include age, antibiotics, and a Western diet high in fat and sugar. Diet plays a pivotal role in maintaining both microbiota diversity and bone health. Nutrients such as calcium, vitamin D, magnesium, and protein are essential for bone metabolism, while prebiotic and probiotic-rich foods, including fiber and fermented products, support gut health. Emerging evidence suggests that specific dietary patterns, such as the Mediterranean diet, can enhance microbial diversity and provide anti-inflammatory benefits, thereby promoting bone strength. Conversely, diets deficient in nutrients or rich in processed foods can exacerbate gut dysbiosis and bone loss. Interventions targeting the gut microbiota, such as the use of prebiotics, probiotics, and synbiotics, hold promise in mitigating osteoporosis progression. Personalized nutrition strategies, tailored to an individual's microbiota profile, may optimize bone health and reduce fracture risk.

This growing field underscores the importance of a multidisciplinary approach integrating diet, microbiota modulation, and conventional osteoporosis therapies. Further research is warranted to better understand the microbiota-diet-bone axis and to develop innovative, microbiota-targeted therapies for osteoporosis prevention and management.

NSS145

DIAGNOSTICS METHODS FOR STUDYING THE BONE DAMAGE IN CANCER PATIENTS

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Background: The bone health monitoring in cancer patients is crucial due to the significant reductions in bone quality and density they experience. Several cancer-associated factors contribute to bone impairment, including cancer treatments that directly affect the delicate balance of bone remodeling, chronic inflammation, nutritional deficiencies, physical inactivity and bone metastasis. As a result, this population has a risk of fractures, which can compromise both their quality of life and prognosis. Traditional diagnostic methods for assessing bone damage in cancer patients include imaging techniques (X-rays, CT, MRI, bone scintigraphy, ultrasound technologies), biochemical markers of bone metabolism and biopsies.

Objectives: This review aims to explore and compare pro and cons of the current available diagnostic methods for assessing bone damage in cancer patients.

Methods: A comprehensive literature review was conducted on the base of the available published data related to X-ray-based and ultrasound-based diagnostic methods. The review evaluated the efficacy, safety, easy to use, of these technologies in bone health assessment in cancer patients and their capability to measure bone quality and predict fracture risk.

Results: While effective for detecting metastases, structural changes, and metabolic activity, X-ray based methods have limitations, such as low sensitivity for early lesions, lack of specificity (scintigraphy), invasiveness (biopsy), and the use of X-rays, which is generally discouraged in cancer patients due to radiation exposure. X-ray-based methods, while standard, pose radiation risks and are less suitable for frequent monitoring in cancer patients. Ultrasound-based techniques provide a safer, non-invasive option. New generation ultrasound-based technologies, such as Radiofrequency Echographic Multi Spectrometry (REMS), have been recognized as a promising alternative to X-rays. REMS studies highlighted their potential to evaluate bone quality, assess fracture risk, and detect microarchitectural changes with higher sensitivity for early bone alterations compared to X-rays. Furthermore, ultrasound-based devices offer portability and lower costs, making them ideal for frequent monitoring.

Conclusion: Ultrasound-based technologies offer a safe, effective, and patient-friendly option for diagnosing and monitoring bone damage in cancer patients

NSS146

HOW CAN SHORT-TERM MONITORING BE HELPFUL TO ASSESS BONE FRAGILITY IN BREAST CANCER PATIENTS?

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Objective: Aromatase inhibitor (AI) therapy in women with estrogen receptor-positive breast cancer (BCs) accelerates bone loss, increasing the risk of osteoporosis and fractures. Effective strategies are essential to prevent fragility fractures. Short-term monitoring of bone fragility in BCs, aiming for early detection and timely intervention to reduce fracture risk is crucial. Current densitometric methods, cannot track changes in BMD over short periods, requiring 1-year between consecutive measurements. Therefore, they are unsuitable for monitoring bone health in BCs.

This study evaluates the potential of radiofrequency echographic multispectrometry (REMS) for short-term monitoring of bone fragility in BCs.

Material and Methods: A review of published studies on REMS technology was conducted to assess whether REMS can effectively monitor bone fragility in the short-term in BCs. The study compares REMS with the gold standard, DXA, both of which assess BMD at axial sites. Key factors like precision, accuracy, ease of use, safety, and cost-effectiveness were evaluated for both methods.

Results: REMS showed higher precision and operator independence, with less than 1% variability. REMS follow-up studies demonstrated a short-term BMD reduction in BCs treated with AI together with a short-term BMD recovery in patients receiving denosumab, at both axial sites (from 6-18 months from treatment starting). REMS indicated strong diagnostic agreement with DXA, showing accuracy in diagnosing osteoporosis. Unlike DXA, which can yield false positives due to artifacts, REMS automatically processes data excluding artifacts. In BCs, particularly those with breast implants used for reconstruction of the breast after mastectomy, REMS could be more reliable than DXA for assessing BMD and fracture risk. REMS also provides a fragility score (FS) that outperformed DXA T-scores in previous papers identifying fragile patients and is available for individuals as young as 20, unlike FRAX, which can be calculated after the age of 40, allowing earlier bone fragility assessment in BCs. Its radiation-free nature enhances safety allows frequent assessments and improves patient adherence.

Conclusion: REMS offers notable advantages over DXA, including higher precision, earlier fragility detection through its FS, and portable design ideal for bedside use in BCs. These features, along with its cost-effectiveness, position REMS as a promising tool for short-term bone health monitoring in this patient population.

NSS147

MANAGEMENT OF BONE FRAGILITY IN PROSTATE CANCER PATIENTS

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Objective(s)

Bone fragility is a significant clinical concern in prostate cancer patients (PCs), particularly those undergoing androgen deprivation therapy (ADT), which increases the risk of osteoporosis and fractures. This highlights the urgent need for early identification of bone damage and short-term monitoring approaches for assessing fragility. This review evaluates current strategies for preventing and managing bone fragility in these patients.

Material and Methods

A recent literature review was conducted on the management of bone fragility in prostate cancer patients, highlighting the impact of hormonal therapies on bone metabolism.

Results

PCs undergoing ADT experience heightened bone fragility due to suppressed testosterone levels. Early detection of bone loss is crucial. Tailored monitoring protocols significantly reduce the risk of severe complications. Recent literature on PCs show the reliability of Radiofrequency Echographic Multi Spectrometry (REMS) technology in assessing bone health in these patients, revealing a significant reduction in lumbar and femoral BMD compared to healthy controls by confirming REMS's effectiveness in the early assessement of osteoporosis, bone fragility, and fracture risk through a simple ultrasound scan of the femur and spine.

Conclusion(s)

Cancer hormonal therapies significantly increase the risk of bone fragility and fractures, Early detection of bone damage and proactive management through short-term monitoring and comprehensive care strategies are needed. Densitometric tools based on REMS technology, coupled with timely interventions, can enhance long-term outcomes and quality of life for cancer patients, facilitating better management of PCs patients, especially those at higher risk due to ADT. This approach meets clinical practice requirements and is essential for the primary prevention of bone fragility.

NSS148

SLEEP DISORDERS AND SARCOPENIA - ASSESSMENT BY POLYSOMNOGRAPHY

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A short multicomponent protocol was developed to assess the risk of falls and fractures in frail or pre-frail elderly patients. Questionnaires and polysomnography are to assess sleep quality in the elderly targeted fragmentation of sleep hours and, consequently, have non-restorative sleep quality, leading to sarcopenia and falls. Sleep disturbances progressively affect cognitive functions and neurodegenerative disorders.

Sarcopenia and osteoporosis are manifestations of frailty in adulthood and the combination of both decrease considerably quality of life.

Persistent chronic hypoxia, oxidative stress and inflammatory responses in patients with obstructive sleep apnea syndrome (OSAS) affect the balance of muscle and bone metabolism, thus increasing the risk of sarcopenia and osteoporosis.

Therefore, the activity will address clinical and functional characteristics linked to non-restorative sleep, parameters assessed by Polysomnography and the consequences of the association between sleep disturbances and osteoporosis in the elderly.

TOPICS:

- Multicomponent protocol design
- Sleep functions
- Sleep quality assessment by questionnaire
- Polysomnography characteristics
- Obstructive sleep apnea syndrome (OSAS)

- Relationship between OSAS, sarcopenia and osteoporosis

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NSS149

SARCOPENIA AND OSTEOPOROSIS ASSESSMENT BY DUAL X-RAY ABSORPTIOMETRY (DXA)

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Sarcopenia is a muscle disease that advances with age across lifetime leading to multiple morbid conditions. Sarcopenic patients present with higher risk of fragility fractures independently of lumbar / spine bone densitometry assessment.

More common in older adults, sarcopenia can also present earlier in life. On 2019, the EWGSOP2 Consensus on Sarcopenia defined that a total body Dual X-ray Absorptiopmetry (DXA) acquisition integrates the algorithm used to define sarcopenia. The consensus defines clear cut-offs for DXA measurements of specific variables used for sarcopenia definition.

DXA is a non-invasive and low energy X-ray technique that takes 05 to 10 minutes to perform a total body acquisition scan. From a total body scan, it is possible to evaluate sarcopenia through the Skeletal Mass Index (ASMI) which is the sum of lean mass on arms and legs divided by square high.

The total body DXA acquisition is performed at the same facility that performs spine and hip scans, with minor positioning issues needed. It makes the total body DXA feasible at a favorable cost-benefit.

Sarcopenia is one of the clinical risk factors that influences treatment decision according to American Association of Clinical Endocrinologists / American College of Endocrinology Clinical Practice Guidelines for the Diagnosis and Treatment of Postmenopausal Osteoporosis issued on 2020.

Since sarcopenia is highly correlated with imminent risk of fractures, a total body composition assessment by DXA, performed alongside a regular bone scan, would enhance risk stratification thus influencing treatment decision. Postmenopausal sarcopenic patients, selected by total body DXA acquisition scan, with spine and hip T-scores higher than -3.0, might benefit from an osteoanabolic-first approach.

The available evidence supports the hypothesis that sarcopenia assessed by total body DXA, in non-fractured postmenopausal patients, could influence decision-making towards an osteoanabolic-first approach.

Further research is necessary to define the most cost-effective cutoffs and indices assessed by total body DXA scans useful for fragility fracture prediction.

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Abstract Book

Posters Abstracts

P101

RESULTS AFTER MULTIDISCIPLINARY TREATMENT IN PATIENTS WITH PRIMARY CHRONIC PAIN, SECUNDARY CHRONIC PAIN AND FIBROMYALGIA

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Introduction: Chronic pain is the most prevalent pathology in terms of functional disability in our country. Our Primary Chronic Pain Unit manages patients with a variety of chronic pain conditions, including musculoskeletal, visceral, post-oncological pain. This study aims to compare pain, fatigue and functional capacity before and after a multidisciplinary treatment approach (medical, psychological, physical and occupational therapy), using the Fibromyalgia Impact Questionnaire (FIQ) as the measure for functional capacity.

Background and Objective: To evaluate the differences in pain, fatigue and functional capacity between patients with Primary Chronic Pain (PCP), Secondary Chronic Pain (SCP), and fibromyalgia (FM) before and afeter multidisciplinary treatment.

Patients and methods: A total of 40 PCP patients, 68 SCP patients and 166 FM patients were enrolled. Pain, fatigue and functional capacity were assessed before and after treatment. All patients received a comprehensive treatment plan involving medical, psychological, physical and occupational therapy. Pain Visual Analogue Scale (VAS), fatigue VAS anf functional capacity were the primary variables analyzed.

Results: Baseline pain scores were 6.23 for FM, 6.75 for PCP, 6,58 for SCP. After treatment, pain decreased to 3,57 for FM, 1,43 for PCP, and 1,67 for SCP.

Baseline Fatigue scores were 6,46/10 for FM, 5,30 for PCP, and 3,54 for SCP. After treatment, fatigue improved to 4.03 for FM, 1,59 for PCP and 1,91/10 for SCP.

Functional capacity (FIQ) improved from 66,67 to 32.71 in FM, from 59.45 to 12.81 in PCP and from 66.00 to 14.97 in SCP.

Conclusions:

Multidisciplinary treatment significantly improved pain, fatigue and functional capacity across all patient groups, demonstrating its effectiveness in managing various chronic pain conditions.

Keywords: Primary Chronic Pain; Secondary Chronic Pain, Fibromyalgia; VAS pain ; VAS fatigue; Disability (FIQ)

P102

SARCOPENIA RISK IN WOMEN WITH POSTMENOPAUSAL OSTEOPOROSIS

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Objective

Osteoporosis and sarcopenia are disorders of bone and muscle, respectively. Studies reported that these disorders were interrelated. However, this relation was explored in older adults and/or with certain comorbidities. Therefore, the aim of this study was to assess the relation between osteoporosis and risk of sarcopenia in postmenopausal women aged ≤ 70 years.

Material and Methods

This multicenter prospective case-control study included 238 postmenopausal women. Dual-energy x-ray absorptiometry was performed to diagnose osteoporosis. Sociodemographic and clinical factors, risk of sarcopenia (SARC-F), muscle strength (grip strength and five-times sit-to-stand test: 5T-STS), and physical activity levels (International Physical Activity Questionnaire-short form) were compared between osteoporotic and non-osteoporotic participants.

Results

No significant differences were observed between participants with or without osteoporosis regarding risk of sarcopenia, skeletal muscle strength, probable sarcopenia, and physical activity level (Table). Osteoporotic group had lower body mass index (BMI) and protein intake. BMD values at L1-4 and femoral neck were not correlated with grip strength and 5T-STS ($p > 0.05$). The older participants ($p = 0.002$) with lower physical activity levels ($p < 0.001$) were found to have higher risk of sarcopenia.

	Non-osteoporosis (n = 119)	Osteoporosis (n = 119)	p
Age	59 (54-64)	58 (55-63)	0.933[a]
BMI	31 ± 5	27 ± 5.1	**<0.001[b]**
Educational status (> 5 years)	31.9	49.6	**0.006[c]**
Covered clothing (with scarf)	70.6	56.3	**0.022[c]**
Menopause age	47 (43-50)	46 (41-50)	0.495[a]
Number of pregnancies	4 (2-4)	3 (2-4)	**0.020[a]**
Current smoking	11.9	22.7	**0.028[c]**
Protein intake (g/day)	43 (31-53)	38 (29-49)	**0.011[a]**
Risk of sarcopenia (SARC-F ≥ 4)	38.7	48.7	0.117[c]
5T-STS (sec)	14 (11.7-16)	13.9 (11.7-16)	0.986[a]
Grip strength (kg)	22 (17.8-26)	23 (18.2-27)	0.329[a]

Probable sarcopenia (grip strength < 16 kg)	15.3	14.5	0.876[c]
Physical activity level (MET-minutes per week)	792 (248-2226)	908 (380-1782)	0.983[a]

[a] Mann Whitney-U test, median (25th-75th percentiles); [b] Independent T-test, mean ± SD; [c] Pearson Chi-Square test, percentage.

Conclusion

There was no elevated risk of sarcopenia in women with postmenopausal osteoporosis aged ≤ 70 years. Risk of sarcopenia was related to older age and lower physical activity level.

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P103

THE STUDY OF VITAMIN D LEVELS IN PATIENTS WITH OBESITY AND OSTEOARTHRITIS

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Objective: Among the numerous factors, influencing the intake, synthesis and metabolism of vitamin D, a significant role is given to metabolic disorders like obesity. There are several mechanisms for reducing vitamin D levels in the blood, including the accumulation of 25(OH)D in adipose tissue and decreased synthesis of cholecalciferol in the skin.

Methods: The analysis of the level of vitamin D (intermediate form in its metabolism - calcidiol or 25(OH)D in the blood serum was carried out in 82 patients with obesity and osteoarthritis (27 men, 55 women aged 49-78 years). The normal level of vitamin D was defined as the concentration of 25(OH)D in the blood serum >30 ng/ml, deficiency — 30 to 20 ng/ml and severe deficiency <10 ng/ml. Body mass index (BMI) was calculated for all patients using the A. Obesity was diagnosed with a BMI ≥30 kg/m2. The 46.3% of patients reported regular intake of vitamin D3 at a prophylactic dose of 2000 IU per day.

Results: According to BMI, patients were divided into 4 groups: 25–29.9 kg/m2 – overweight (n=19), 30–34.9 kg/m2 – grade 1 obesity (n=22), 35–39.9 kg/m2 – grade 2 obesity (n=27), 40 kg/m2 and more – grade 3 obesity (n=14). Most patients in groups 1 and 2 (73.7% and 72.7%) had vitamin D deficiency (25.8±2.6 ng/ml and 23.1±2.8 ng/ml), no significant differences were found between the groups. Among patients in groups 3 and 4, vitamin D deficiency was predominant (16.7±4.1 ng/ml and 14.9±3.8 ng/ml), with a significantly higher number of patients ($p<0.05$) with severe vitamin D deficiency. A negative relationship was found between the 25(OH)D level and patients' BMI ($r= - 0.12$, $p=0.04$), which allows us to consider obese patients as a risk group for vitamin D deficiency.

Conclusion: The patients with overweight have a decrease level of vitamin D3, which correlates with the degree of obesity. Thus, it is necessary to identify obese patients as a separate risk group for vitamin D deficiency, determine their serum 25(OH)D levels, and, if a deficiency or deficiency is detected, recommend taking higher doses of cholecalciferol.

P104

THE FEATURES OF OSTEOPOROSIS DEVELOPMENT IN PATIENTS WITH OBESITY AND COMORBID PATHOLOGY

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Objective: Osteoporosis (OP) and obesity are two common diseases, each of them has own unique characteristics and health consequences. OP characterized by decreased bone density and an increased risk of fractures, is often associated with factors such as age, gender, genetics, and physical activity level. However, in recent decades it has become apparent that obesity also plays a significant role in the development of this disease.

Methods: An analysis of 67 patients aged from 49 to 76 years (mean age 57.1±8.3 years) with excess body weight and a confirmed diagnosis of OP based on X-ray densitometry of the spine and/or proximal femur were identified. At the same time, 62.7% of patients had a high and very high BMI. Among the concomitant diseases, type 2 diabetes mellitus (DM), arterial hypertension, ischemic heart disease, and osteoarthritis were most often noted.

Results: According to the results, osteopenia was prevailed in patients with a BMI of 25.0-29.9 kg/m², while with a BMI of more than 30.0 kg/m², there was a tendency for bone mineral density (BMD) to decrease with the development of OP. The fractures of the vertebral bodies and femoral neck were diagnosed in 21 patients (31.3%) mostly with a BMI more than 30.0 kg/m. When assessing comorbid diseases, the lowest manifestations of bone pathology were observed in patients with type 2 diabetes, which did not correspond to a higher incidence of fractures of both the vertebral bodies and the femur in this category of patients. Also, OP was noted in individuals with poorly controlled arterial hypertension, which may be associated with hyperactivation of the sympathetic nervous system and the effect on bone resorption. A higher incidence of OP was noted in patients with polyosteoarthrosis in the late stages.

Conclusion: Thus, the significant disorders of bone metabolism were noted in individuals with BMI more than 30.0 kg/m² and with poorly controlled arterial hypertension and in the late stages of polyosteoarthrosis. The obtained results require further more detailed study.

P105

INCIDENCE OF FEMUR FRACTURE IN IRAQ AND THE DEVELOPMENT OF NATIONAL IRAQI FRAX MODEL

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The development of an accurate, country-specific FRAX model requires a reliable estimation of the incidence rate of major osteoporotic fractures, particularly femur (hip) fractures, which are a critical indicator of osteoporosis risk. This Retrospective study aims to calculate the national incidence rate of femur fractures to support the establishment of a precise FRAX model tailored for our population.

This study documented the incidence of hip fractures in Iraq in order to permit the construction of Iraqi FRAX model. The study to define the incidence of hip fracture was developed in collaboration between doctors from institutes belong to Ministry of Health & Ministry of Higher Education to represent by (Iraqi National FRAX Group).Using data from hospital records, databases, and registries, we identified and analyzed cases of femur fractures over 2022 & 2023.

In this study include all the numbers of hip fractures from all Iraqi governates. Data on hip fracture were collected on Iraqi citizens age 40years and above irrespective of degree of trauma.In both sex, the incidence of hip fracture increased with age as expected. The total incidence of hip fracture in Iraq for 2022 and 2023 Male incidences were higher than females, The incidence in 2023 is higher than in 2022.Mortality rate is higher in male in 2022 & 2023.

This study emphasizes the importance of country-specific data in accurately estimating osteoporosis risk and enhancing preventive strategies through the FRAX tool, ultimately improving patient outcomes and reducing healthcare burdens associated with osteoporotic fractures.

P106

DECODING THE MYSTERY: WHEN RHEUMATOID ARTHRITIS ISN'T WHAT IT SEEMS

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Pachydermoperiostosis (primary hypertrophic osteoarthropathy) is a rare familial autosomal dominant disease. Complete form characterized by triad of skin thickening (pachydermia), skeletal manifestation (periostosis and arthritis), and finger clubbing. Pachydermoperiostosis has been associated with many clinical conditions noted in different case reports, and this include; arthritis and osteoporosis. We report a patient who had complete form of this syndrome in association with Osteoporosis and Rheumatoid arthritis mimic .

Keywords: pachydermoperiostosis, hypertrophic osteoarthropathy, rheumatoid arthritis, tofacitinib.

P107

THE RATE OF BONE MINERAL DENSITY LOSS IN ELDERLY WOMEN WITHOUT BASELINE ANTI-RESORPTIVE THERAPY

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Objective: To analyze the rate of age-related bone mineral density (BMD) loss in the central skeleton of elderly women using dual-energy X-ray absorptiometry (DXA).

Materials and Methods: a retrospective observational study was conducted over 36 months at the Republican Clinical Medical Center of Belarus. It included 27 postmenopausal women aged 70 years and older (mean age: 75.3 ± 4.5 years) with osteoporosis, who had not undergone anti-resorptive therapy. BMD was assessed at the lumbar spine and proximal femur using a GE Healthcare Lunar Prodigy DXA scanner (2018). Data analysis was performed with STATISTICA 10.0, using parametric statistical methods.

Results:

Initial BMD Measurements:

- Lumbar spine: 0.96 ± 0.15 g/cm²
- Left femoral neck: 0.75 ± 0.09 g/cm²
- Right femoral neck: 0.73 ± 0.07 g/cm²

Changes Over 36 Months:

- Lumbar spine BMD decreased by 0.5% (0.937 ± 0.145 to 0.915 ± 0.155 g/cm², p=0.001).
- Left femoral neck BMD decreased by 5.2% (0.727 ± 0.095 to 0.695 ± 0.092 g/cm², $p=8.2 \times 10^{-7}$).
- Right femoral neck BMD decreased by 5.9% (0.721 ± 0.066 to 0.710 ± 0.063 g/cm², p=0.0003).

Annual BMD Loss Rates:

- Lumbar spine: 0.17% per year
- Left femoral neck: 1.97% per year
- Right femoral neck: 1.73% per year

Degenerative changes in the lumbar spine were noted in 48.1% of women, with 37.0% presenting vertebral deformities. Artifacts, such as osteoarthritis and femoral head necrosis, affected 3.7% of femoral scans.

Discussion: The significant difference in the rate of BMD loss between the lumbar spine and femoral regions was influenced by artifacts. Degenerative spinal changes, including vertebral deformities and pathological ossification, falsely elevated lumbar spine BMD values. This highlights the importance of considering artifacts when interpreting DXA results.

Conclusions:

1. Over 36 months, the average annual BMD loss rates in postmenopausal women aged ≥70 years were 0.17% in the lumbar spine, 1.97% in the left femoral neck, and 1.73% in the right femoral neck.
2. Artifacts, such as vertebral deformities and degenerative changes, contributed to discrepancies in BMD loss rates be-

tween the spine and femoral regions.
This study underscores the need for accurate interpretation of DXA results, particularly in older women with osteoporosis, to better evaluate BMD changes and the risk of fractures.

P108

VARIABILITY IN BONE MINERAL DENSITY MEASUREMENTS USING RADIOFREQUENCY ECHOGRAPHIC MULTI-SPECTROMETRY COMPARED TO DUAL-ENERGY X-RAY ABSORPTIOMETRY IN A PATIENT WITH PAGET'S DISEASE

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Objective: Dual-Energy X-ray Absorptiometry (DXA) is the standard for evaluating bone mineral density (BMD), but emerging technologies, like Radiofrequency Echographic Multi-Spectrometry (REMS), are gaining attention for assessing bone quality without radiation. This clinical case questions whether REMS can be considered a valid diagnostic technique for various patient groups, including those with Paget's disease.
Material and methods: A 68-year-old female (weight 90 kg, height 154.8 cm, BMI - 37.6 kg/m²) two years ago began experiencing left hip joint pain. A year later, a traumatologist diagnosed left-sided coxarthrosis and prescribed NSAIDs, which moderately reduced pain. MRI from May 2024 showed stage III osteoarthritis in the left hip joint, with diffuse irregularity in the left femur, increased bone volume, and increased cellularity. Laboratory results showed alkaline phosphatase - 207 U/L (35-104), B-crosslaps - 0.962 ng/mL (<0.573), total Ca - 2.67 mmol/L (2.15-2.55), P - 1.32 mmol/L (0.81-1.45), PTH -73.1 pg/mL (15-65) and 25(OH) vitamin D -14.7 ng/mL. Paget's disease of the left femur was confirmed by X-ray of the pelvic bones, CT scan, and a whole-body bone scintigraphy showed a monoossal involvement. The patient underwent two different densitometry modalities, REMS and DXA, that showed principal differences at the site of Paget's lesion. According to REMS the BMD at the lumbar spine (L_2) showed osteopenia (-2.3 SD by T-score) with normal at the left femoral neck (-0.4 SD) and the right femoral neck (-0.3 SD).However, DXA at the lumbar spine (-2.5 SD by T-score in L_1-L_3) was consistent with osteoporosis, while the left femoral neck and total femur showed values significantly higher than normal – +6.0 SD and +9.0 SD by T-score, and the right femoral bone indicated a reduction in bone mass to -1.4 SD and -0.8 by T-score, accordingly. The patient was initiated on anti-resorptive therapy with 5 mg intravenous zoledronic acid.
Results and conclusions: REMS is a relatively new method for assessing bone quality and diagnosing osteoporosis. It offers reliable precision, predicts fracture risk and may overcome some DXA limitations. Still, this case highlights the need for further evaluation of REMS's reliability in different patient groups compared to gold standard methods.

P109

A FEMALE PATIENT WITH LIVER INJURY FOLLOWING ZOLEDRONIC ACID INFUSION FOR OSTEOPOROSIS

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Introduction: Only a small number of cases have documented liver damage following zoledronic acid (ZOL) infusion.
Purpose: Description of a patient with transient hepatotoxicity following ZOL infusion.
Case description: We present the case of a 60-year-old woman with severe postmenopausal osteoporosis and a history of parathyroidectomy due to primary hyperparathyroidism four years before, who experienced temporary liver toxicity following ZOL treatment. Two days after the ZOL infusion, the patient developed a fever reaching up to 38°C, and serum levels of aspartate aminotransferase (AST), alanine aminotransferase (ALT), and gamma-glutamyl transferase (GGT) increased by 3.9, 5, and 1.7 times, respectively, compared to baseline values. Further biochemical and serological testing showed no evidence of any underlying liver or systemic disorder. The levels of ALT, AST, and GGT returned to normal within three weeks after treatment.
Conclusion: Given the limited understanding of ZOL-induced hepatotoxicity and the unclear mechanism, it is essential for clinicians to be aware of this potential risk. Increased vigilance and careful monitoring are crucial to minimizing adverse effects and ensuring patient safety.

P110

LEVERAGING ARTIFICIAL INTELLIGENCE FOR ENHANCED DETECTION OF OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURES: A MULTICENTER EVALUATION

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Objective: Vertebral compression fractures (VCFs) are a prevalent yet underdiagnosed manifestation of osteoporosis, significantly contributing to morbidity and mortality. Despite advancements in imaging, many VCFs remain unreported in routine radiological analyses, delaying critical interventions. This study compares the standard of care against opportunistic screening powered by an AI tool to identify moderate-to-severe VCFs from computed tomography (CT) scans performed for various clinical indications.
Material and Methods: A retrospective, cross-sectional, multicenter study analyzed CT scans from patients aged ≥50 years, collected over two months across four tertiary hospitals from Assistance Publique des Hôpitaux de Marseille (France). Scans

flagged by CINA-VCF Quantix (Avicenna.AI, La Ciotat, France) were reviewed by expert radiologists. Discrepancies between the AI and clinical reports were analyzed to calculate AI false positive rate (FPR), positive predictive value (PPV), overall agreement between AI and experts, and clinical reports' false negative rate (FNR). Additionally, the number of scans needed to screen (NNS) to detect one additional VCF using the tool compared to the standard of care, was computed.

Results: A total of 2224 cases were analyzed and 489 were flagged as positive by the AI. Of these, 312 were confirmed as true positives, yielding a PPV of 63.8% (95%CI: 59.4%-68.1%) and a FPR of 36.2% (95%CI: 32.0%-40.6%). Regarding the clinical reports' FNR, there were 31.1% [27.0% - 35.4%] of fractures identified by the AI but missed in initial reports. Per-vertebra agreement was 95.8% [95%CI: 95.4%-96.3%] with values ranging from 80.3% for L5 to 99.0% for L2. Main causes of FP were Schmorl's nodes, natural L5 deformities and artifacts from surgical materials. The NNS was estimated at 14.6, indicating that analyzing 14.6 scans with AI detects one additional VCF compared to standard practice.

Conclusion: The AI tool demonstrated strong potential to enhance VCF detection, addressing significant gaps in osteoporosis care. While its integration can streamline workflows and improve FNR, human validation remains crucial to mitigate false positives and ensure clinical relevance. Future research should focus on real-time implementation and assessing impacts on patient outcomes and healthcare resource utilization.

P111

URINARY PENTOSIDINE AS A POTENTIAL BIOMARKER OF IMPAIRED BONE HEALTH: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Objective

Urinary pentosidine, an advanced glycation end product (AGE), has been proposed as a potential biomarker for impaired bone health, especially in older adults and those with diabetes. This study aimed to systematically review and meta-analyze the association of urinary pentosidine with bone mineral density (BMD), fracture risk, and osteoporosis.

Methods

A comprehensive search of Embase, PubMed, Scopus, and Web of Science databases was conducted and records were gathered from 1960 to February 2024. Relevant papers were screened and data were extracted by two independent reviewers. Hedges' g standardized mean difference (SMD) and 95% confidence intervals (CI) were calculated to compare urinary pentosidine levels between patients with and without fractures.

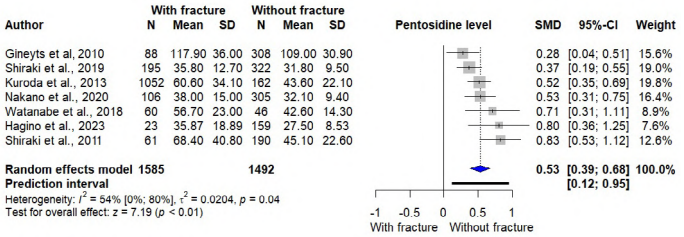
Results

A total of 12 studies comprising 5,878 participants were included in the systematic review. The meta-analysis revealed that patients with fractures had significantly higher urinary pentosidine levels compared to those without fractures (SMD [95% CI] = 0.53 [0.39-0.68]; I^2 = 54%; P < 0.01). In patients with vertebral fractures, pentosidine levels were also elevated (SMD [95% CI] = 0.51 [0.32-0.70]; I^2 = 64%; P < 0.01). Additionally, some studies demonstrated that an increase in urinary pentosidine was significantly associated with fracture risk (aHR = 1.20 [95% CI = 1.07-1.33]; P = 0.001) and BMD reduction (β = -0.125 [95% CI = -0.248, -0.002]; P = 0.047). However, other studies showed inconsistent results, particularly regarding the association between pentosidine and BMD or fracture risk in non-diabetic populations (aRR [95%CI] = 1.08 [0.79-1.49]; P = 0.6). Diagnostic accuracy analyses revealed a sensitivity of 71.9% and specificity of 61.2% for urinary pentosidine in predicting vertebral fracture in patients with type 2 diabetes mellitus.

Conclusion

This systematic review and meta-analysis demonstrate that elevated urinary pentosidine levels are associated with an increased risk of fractures and, to a lesser extent, reduced bone mineral density. Its diagnostic accuracy improves when integrated with other clinical markers, such as BMD and bone turnover indices. However, due to the variability in results, further research is needed to standardize pentosidine's use as a reliable biomarker for impaired bone health in clinical practice.

Keywords: Urinary pentosidine, bone health, bone mineral density, systematic review, predictive biomarker



P112

A SYSTEMATIC REVIEW OF THE ASSOCIATION BETWEEN INSULIN RESISTANCE SURROGATE INDICES AND BONE MINERAL DENSITY

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Objective
The relationship of insulin resistance with bone mineral density (BMD) remains unclear, offering an opportunity for novel indices to shed light on the matter. The aim of this review was to evaluate the association between surrogate indices of insulin resistance and BMD.
Methods
A systematic review was conducted to evaluate observational studies that examined the relationship between insulin resistance surrogate indices and BMD in adults. Databases including PubMed, Web of Science, Scopus, and Embase were searched. Quality assessment was performed using Joanna Briggs Institute (JBI) critical appraisal tools.
Results
This systematic review included 27 cohorts and cross-sectional studies with 71,525 participants to assess the potential link between insulin resistance surrogate indices like HOMA-IR, HOMA-β, TyG, TyG-BMI, TyG-WtHR, and TyG-WC, along with METS-IR, and VAI, and BMD at various sites. There seems to be no link between BMD and the HOMA index, despite being extensively studied in various studies (adjusted β ranging from -0.49 to 0.103). Most literature suggests that a higher TyG index is associated with decreased BMD levels (adjusted β ranging from -0.085 to 0.0124). Despite limited evidence, other insulin resistance indices such as VAI (adjusted β ranging from 0.007 to 0.016), TyG-BMI (adjusted β ranging from 0.002 to 0.415), METS-IR (adjusted β ranging from 0.005 to 0.060), TyG-WtHR (β = 0.012) and TyG-WC (β = 0.0001) have shown a positive association with BMD in a few studies.
Conclusion
This systematic review emphasizes the intricate connection between insulin resistance and BMD. The lack of ability to perform a meta-analysis and the dependence on cross-sectional studies hinder the robustness of the findings, hence necessitating well-designed longitudinal studies.
Keywords: Insulin resistance, Bone mineral density, HOMA-IR, TyG index, VAI, Systematic review, Osteoporosis, BMD, Metabolic health

P113

APPLICATION OF OSTEOPONTIN (OPN) LEVELS AS A BONE TURNOVER BIOMARKER: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Objective: To evaluate the clinical relevance of osteopontin (OPN) as a bone turnover biomarker by assessing its association with osteoporosis, fractures, and bone mineral density (BMD) through a systematic review and meta-analysis.
Material and Methods: A systematic search was conducted across PubMed, Scopus, Web of Science, Embase, and Cochrane Library for studies published up to October 2024, reporting OPN levels in relation to bone health. Eligible studies included cross-sectional, case-control, and cohort designs. Standardized mean difference (SMD) with 95% confidence intervals (CI) was calculated to assess the association between OPN and outcomes. Random-effects models were employed, and heterogeneity was assessed using the I^2 statistic. Subgroup analysis based on study design was conducted. Meta-regression analysis was performed using confounding variables age, female percentage, and body mass index (BMI).
Results: The meta-analysis included 27 studies encompassing 4,062 participants. OPN levels were significantly elevated in patients with osteoporosis when compared with controls (SMD: 0.68 [95% CI: 0.45 to 0.91], $P < 0.001$; $I^2 = 71\%$). Also, when comparing patients with fractures vs. controls, OPN levels were analyzed to be statistically significantly higher (SMD: 0.72 [95% CI: 0.49 to 0.95], $P < 0.001$; $I^2 = 59\%$). According to some of the included studies, OPN levels were inversely associated with BMD. Subgroup analysis confirmed that cohort studies, similar to cross-sectional designs, demonstrated the observed associations between OPN and bone health outcomes. Meta-regression analysis revealed that heterogeneity in the osteoporosis association with OPN was partially explained by age ($P = 0.03$) and female percentage ($P = 0.02$), while BMI did not significantly contribute ($P > 0.05$). Sensitivity analyses confirmed the robustness of these findings.
Conclusion: This study identifies elevated OPN levels as a strong biomarker for increased risk of osteoporosis, fracture, and lower BMD. Moreover, age and female percentage positively influence the association with osteoporosis. However, further research is needed to explore OPN's role in bone health and its potential clinical applications.
Keywords: Osteopontin (OPN); Bone mineral density (BMD); Osteoporosis; Fracture; Biomarker; Meta-analysis

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BONE METABOLISM DISORDERS IN BREAST CANCER PATIENTS TREATED WITH AROMATASE INHIBITORS

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It is known that bone health is largely determined by the level of human sex hormones. The development of diseases or conditions that disrupt the synthesis of sex hormones contributes to bone metabolism disorders and can lead to osteoporosis (OP) and fractures.

The aim of our study was to investigate the prevalence of osteoporosis among patients with breast cancer (BC) receiving aromatase inhibitors (AI) or tamoxifen, depending on the duration of therapy, and the clinical efficacy of Denosumab, Zoledronic acid and Alendronates in the treatment of osteoporosis.

Materials and methods:

The study was performed using a retrospective analysis of outpatient records of 200 patients with BC receiving AI or tamoxifen. Bone density was assessed according to WHO recommendations using dual-energy X-ray osteodensitometry once a year. The level of bone remodeling was assessed by ELISA-test using commercial kits. The level of bone pain was assessed using the Visual Analogue Scale.

Results.

The study included 200 patients from 32 to 67 years old (mean age 53.25 ± 11.17 years). The average duration of the disease was 3.96 ± 1.98 years. The study showed that 22% (44 patients) had bone mineral density (BMD) below the age norm already in the first year of therapy. The incidence of osteopenia and osteoporosis directly correlated with the duration of such therapy: among patients in the fifth year of therapy, the prevalence of osteoporosis was 47% (94 patients) (p = 0.001).

During the study, groups of patients were identified who were prescribed antiresorptive therapy: 27 patients (Group I) - Denosumab (60 mg subcutaneously, once every 6 months); 39 patients (Group II) Zoledronic acid (5 mg intravenously, once every 12 months); 28 patients (Group III) Alendronates 70 mg per week per os. The control group consisted of 106 patients with normal BMD or osteopenia, with a low risk of fractures according to the FRAX index, who were recommended calcium preparations and cholecalciferol without antiresorptive drugs. The analysis showed that all antiresorptive drugs contributed to the preservation of bone density and a decrease in bone pain. In the group without antiresorptive therapy, bone density continued to decrease and bone pain persisted.

Discussion and conclusions:

In the treatment of breast cancer, aromatase inhibitors and tamoxifen are the most important components of the pathogenetic treatment of the disease. However, such therapy leads to accelerated bone resorption and, therefore, contributes to a decrease in bone mineral density and significantly increases the risk of secondary osteoporosis. According to clinical guidelines, antiresorptive therapy is prescribed to patients who already have osteoporosis, low-energy fractures, or a high risk of fractures according to the FRAX index. To date, there are no recommendations for prescribing antiresorptive therapy for the prevention of osteoporosis. However, there is already some scientific data on the effectiveness of preventive antiresorptive treatment [1,2]. Our study also confirmed the need for such therapy in the pathogenetic treatment of breast cancer using aromatase inhibitors or tamoxifen to prevent bone metabolism disorders.

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P115

THE KEYSTONE MECHANISM THEORY OF PAIN: MODERNIZED VERSION OF THE BIOPSYCHOSOCIAL MODEL

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Introduction:

The biopsychosocial model (BPSm) has long been discussed in musculoskeletal research and practice and was proposed as an improvement to the biomedical model (BMM). Its applicability is limited due to its wide range of interpretations in clinical scenarios. The putative conclusions from BPSm were thought to deliver disease insights, but they offer limited tools for validating knowledge claims and are assertions on arguments and conceptual errors. This overarching conceptual framework may have paved the way for newer approaches to authenticate its underlying principles and scientific claims.

Enactive modernization of BPSm:

Convergence of the “humanistic” interpretation (person and relationship-centeredness) and “causation” interpretation (multifactorial contributors to health and illness) of BPSm leads to the recently discussed “Enactive” approach (Enactivism). The foundation of Enactivism lies in phenomenology, pragmatism, and cognitive sciences properly addressing musculoskeletal pain and the correlation of multiple factors in pain origination and maintenance. Listening and validating a person’s experiences as practical, regardless of an outsider's perspective, may foster clinician-patient trust and mitigate stigmatization.

Beyond BPSm- The Keystone approach:

Identifying "keystone" pain mechanisms, which are critical in the

pathophysiology of pain, is essential for understanding complex causal factors, including biological, psychological, and social influences. These keystones, like the central stone in an arch, are built upon multiple upstream factors but are crucial for system integrity. This approach moves beyond reductionism and aims to identify key biomarkers that explain treatment response variability across individuals, notable examples include- static and dynamic quantitative sensory testing (QST), neuroimaging, and psychometry. The keystone mechanism model guides interdisciplinary research to identify and measure key pain mechanisms, aiming to develop composite biomarkers that are clinically feasible, cost-effective, and reliable without compromising sensitivity.

Conclusion:

BPSm may not be used to define diseases, distinguish disease from non-disease states, or identify genuine cause-effect relationships, nevertheless it may be a useful tool to organize and communicate information about the psychosocial determinants of health. The Keystone approach offers a pragmatic balance and is theoretically and practically beneficial for transitioning from treating populations to individual people, overcoming the shortcomings of current treatments, and mitigating the failure to target the right treatment to the right patient.

P116

ORGAN-ON-CHIP MODELS IN OSTEOARTHRITIS (OA) RESEARCH: STRATEGIES AND APPLICATIONS

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Introduction:

Despite scientific recognition of Osteoarthritis (OA) as a whole-joint disease, the complexity of the OA pathophenotype is not accurately reflected in current research. Fluidic integration of the joint microenvironment can greatly enhance the existing in vitro OA models, mimicking physiologic tissue environments. These technologies play a transformative role as they enable an accurate depiction of pathogenesis, offering deeper insights into molecular and cellular mechanisms driving the disease, thus accurately resembling joint tissues, and facilitating the study of intricate cellular interactions.

Soluble Tissue Crosstalk in Osteoarthritis:

Mechanical stimulation, multi-tissue, and immune cell interactions work together through micro-engineered devices combining biomaterials, 3D cell cultures, and microfluidics within the internal device architecture to regenerate and nudge the native tissue environment in OA and multiple tissue models. Mechanical stimulation in joint-on-a-chip models mimics knee joint forces, influencing chondrocyte behavior via mechanotransduction. Advances in microengineering use PDMS [poly(dimethylsiloxane)] to apply compressive stress, but challenges exist in strain control, imaging, and shear stress effects. Models like the "microJoint" integrate cartilage, bone, synovium, and sensory neurons, enabling the study of interactions, inflammatory responses, and joint pathogenesis. This model also helps integrate macrophages, monocytes, and endothelial cells, replicating immune cell interactions, such as monocyte extravasation, thus helping to study OA pathogenesis.

Bioengineering Roadmap and Future Prospects:

Joint-on-chips (JOCs) face key challenges in device engineering, replicating joint physiology, and generating useful readouts. Material selection, manufacturing scalability, and integration of functionality impact device design. Improving cell sourcing, near-native and tissue-specific extracellular matrix, mechanical environments, and collagen fiber arrangements and morphology is crucial for more accurate OA modeling. Advancements like organoids, stem cell differentiation, and 3D bioprinting offer promising solutions, while addressing systemic factors and creating "body-on-a-chip" models can further enhance OA research.

Conclusion:

The development of these systems could bridge the gap between in vitro and in vivo studies and help identify effective treatments for OA. Combining the cartilage-on-a-chip system with other musculoskeletal tissues like synovium and subchondral bone will provide a holistic view of tissue-tissue interactions governing OA onset including inflammation, fibrosis, and degradation of joint tissues. However, challenges remain in designing JOCs that replicate the full complexity of joint biology and disease.

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ASSESSMENT OF ADHERENCE TO BISPHOSPHONATE THERAPY AMONG PATIENTS WITH POSTMENOPAUSAL OSTEOPOROSIS DURING WARTIME

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Objective: To evaluate the adherence to bisphosphonate treatment among patients with postmenopausal osteoporosis during wartime conditions and identify key barriers to sustained therapy.
Methods: A cross-sectional observational study was conducted from March 2023 to November 2024 involving 210 postmenopausal women diagnosed with osteoporosis based on bone mineral density (BMD) (T-score ≤ -2.5). Participants were recruited from regions affected by the ongoing conflict in Ukraine. Adherence to bisphosphonate therapy was assessed using the Medication Adherence Report Scale (MARS-5) and pharmacy refill data. A structured questionnaire evaluated sociodemographic factors, access to healthcare, and psychological stress during wartime. Adherence was defined as taking ≥80% of prescribed doses over the study period. Descriptive and inferential statistics were applied, with subgroup analyses based on geographic location and access to healthcare services.
Results: Only 42.4% (n = 89) of patients demonstrated adherence to bisphosphonate therapy. The most frequently reported barriers were disrupted access to healthcare services (reported by 65% of non-adherent patients), medication shortages (53%), and high levels of psychological stress (48%). Patients residing in conflict zones showed significantly lower adherence rates (26.7%, n = 40) compared to those in more stable areas (62.1%, n = 49; $p < 0.001$). Among adherent patients, the mean MARS-5 score was 20.3 ± 1.4, while non-adherent patients had a mean score of 12.7 ± 2.8 ($p < 0.01$). Multivariate analysis identified disrupted healthcare services (OR: 3.5, 95% CI: 2.1–5.9) and psychological stress (OR: 2.8, 95% CI: 1.6–4.6) as the strongest predictors of non-adherence.
Conclusion: Wartime conditions have a profound negative impact on adherence to bisphosphonate therapy among patients with postmenopausal osteoporosis. With adherence rates below 50%, urgent measures are needed to address barriers such as healthcare disruptions, medication shortages, and mental health challenges. Interventions like telemedicine, mobile healthcare units, and mental health support could significantly improve outcomes in this vulnerable population.

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ASSESSMENT OF THE IMPACT OF DEPRESSIVE AND ANXIETY DISORDERS ON TREATMENT ADHERENCE IN PATIENTS WITH KNEE OSTEOARTHRITIS DURING WARTIME

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Objective: To investigate the influence of depressive and anxiety disorders on treatment adherence in patients with knee osteoarthritis (OA) under wartime conditions and identify associated risk factors.
Methods: A cross-sectional observational study was conducted between April 2023 and August 2024. The study included 175 patients diagnosed with knee OA based on clinical and radiological criteria (Kellgren-Lawrence grades II-III). Participants were recruited from war-affected regions. Depressive and anxiety symptoms were assessed using the Hospital Anxiety and Depression Scale (HADS), with scores ≥8 indicating clinically significant symptoms. Treatment adherence was evaluated using the Medication Adherence Report Scale (MARS-5), with adherence defined as taking ≥80% of prescribed medications and following lifestyle recommendations. Statistical analyses included descriptive statistics, chi-square tests, and multivariate logistic regression to identify predictors of non-adherence.
Results: Adherence to treatment was observed in only 38.3% (n = 67) of patients. Depressive symptoms were present in 54.9% (n = 96) of patients, and anxiety symptoms in 61.7% (n = 108). Patients with clinically significant depressive symptoms had markedly lower adherence rates (23.9%, n = 23) compared to those without depression (55.6%, n = 44; $p < 0.001$). Similarly, patients with anxiety symptoms showed lower adherence (30.6%, n = 33) compared to non-anxious patients (50.8%, n = 34; $p = 0.02$). Multivariate analysis revealed depressive symptoms (OR: 3.7, 95% CI: 2.1–6.5) and anxiety symptoms (OR: 2.4, 95% CI: 1.4–4.2) as strong predictors of non-adherence, along with disrupted healthcare access (OR: 3.2, 95% CI: 1.9–5.3).
Conclusion: Depressive and anxiety disorders significantly impair treatment adherence in patients with knee osteoarthritis during wartime. With adherence rates below 40%, addressing mental health is critical for optimizing OA management. Integrating mental health screening and support into routine OA care, especially in war settings, could enhance adherence and improve patient outcomes.

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EFFECTS OF DENOSUMAB BEYOND THE BONE RESORPTION: THE ROLE OF SERUM IGF1

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Introduction

In some populations, reduced serum IGF-1 levels has been associated to osteosarcopenia. Osteoporosis and sarcopenia share similar risk factors, highlighting muscle-bone interactions, which may result in debilitating consequences, such as falls and fractures. IGF-1 is the main growth factor in the bone matrix, has a predominant anabolic bone effect and regulates the expression of receptor activator of nuclear factor kappa-B ligand (RANKL). Denosumab is a monoclonal antibody that binds RANKL preventing osteoclast differentiation, used in the treatment of osteoporosis because it reduces the incidence of fragility fractures.

Aims

To analyze the variation of IGF-1 levels in patients with severe osteoporosis under denosumab and its relationship with bone turnover markers.

Methods

Retrospective single-center analysis of female patients with osteoporosis and fragility fractures treated with denosumab. Data were obtained from electronic health records and included age at the beginning of denosumab, duration of therapy, IGF-1 and bone turnover markers (BTM) [Procollagen-1 N-terminal Propeptide (P1NP), bone alkaline phosphatase (BALP), C-terminal telopeptide (CTX) and osteocalcin] before treatment and at the time of its interruption or at the last appointment.

Results

The study included 37 female patients. The mean age at the beginning of denosumab was 71,8 ± 11,7 years old, with mean duration of therapy of 37,3 ± 17,0 months. Treatment with denosumab was associated with a statistically significant reduction in all four BTM, with CTX showing the greatest decrease (57,5%), followed by osteocalcin (53,2%), P1NP (48,1%) and BALP (34,3%). IGF-1 levels reduced by 7,5% (mean level before denosumab 100,7 ng/mL, after denosumab 93,2 ng/mL), without attaining statistical significance (p = 0,413).

Conclusions

In this population, the treatment with denosumab led to the expected decrease in all bone turnover markers, with the biggest expression in CTX, in agreement with the inhibition of bone resorption. It also led to a decrease in serum IGF-1, accompanying the BTM trend, but without statistical significance. Although serum IGF-1 levels do not always directly represent bone IGF-1 levels, these preliminary results of a small cohort point to a lack of effect of denosumab on the bone anabolic action of IGF-1 and on its possible muscle-bone interactions.

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MORTALITY REVIEW OF HIP FRACTURE PATIENTS OVER A TWELVE-MONTH PERIOD ADMITTED TO A NORTHWEST ENGLAND TEACHING HOSPITAL

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Objective: A mortality review to analyse the numbers of patients who experience ongoing deterioration and die during initial admission or within subsequent twelve months after the hip fracture admission.

Material and Methods: Audit of National Hip Fracture Database data for all patients admitted to a Northwest England Teaching NHS Hospital in the year 2022. Supplemented by a retrospective review of mortality data over a 12-month period from date of initial hip fracture.

Results: A total of 945 patients (average age 81 yrs.) were admitted with fractured neck of femur (NOF) over the twelve-month period from January to December 2022, of which 675 (72%) were females. 33 patients received conservative treatment as were deemed not fit for surgery due to multiple medical comorbidities. 26% of all patients died within 12 months of injury. There was no significant difference in death rate (28.3% vs 26.2%) or age (82yrs.vs 84yrs.) between male and female patients. Most deaths (68.6%) occurred within the first 6 months of hip fracture. Of these 30.4% of deaths occurred during the initial admission with fractured hip. Again, there was no difference in age between male and female patients (84vs82). A further 32.3% of deaths occurred on subsequent admission/s to hospital/ hospice with ongoing deterioration/ advancing frailty and progressive co-morbidity up to 12 months following hip fracture.

Conclusion

Our data compares well with the ICCONIC study (1) and shows the high morbidity and mortality in frail elderly patients with NOF. It emphasises the need to initiate supportive care conversations during the initial hip fracture admission in all such patients. Hip fracture admission offers the opportunity for patients to identify care preferences, make informed decisions about care and receive referrals to appropriate services, to ensure quality end of life care provision, in turn, reducing inappropriate readmission to hospital for those near the end of life (2, 3).

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A COMPARISON BETWEEN ASYNCHRONOUS AND PHANTOMLESS CALIBRATION METHODS FOR THE OPPORTUNISTIC SCREENING OF OSTEOPOROSIS ON LUMBOSACRAL SPINE CT SCANS

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Objective
The aim of this retrospective study is to compare the accuracy of several asynchronous and phantomless calibration methods for the opportunistic determination of bone mineral density (BMD) on standard CT scans of the lumbosacral spine.
Material and Methods
Calibration methods were tested on a cohort of 26 patients (mean age = 61.5 years; 46.2% males and 53.8% females) at risk for osteoporosis who underwent CT using a standard spine protocol (tube voltage = 120 kVp, slice thickness = 1.25 mm; no contrast) for non-dedicated indications. Average BMD (mg/cc) was calculated by placement of a region of interest (ROI) in the body of L4. Asynchronous calibration using a dipotassium phosphate (K_2HPO_4) phantom and internal calibration using five reference ROIs (air, subcutaneous adipose tissue, skeletal muscle, cortical bone and blood) or three reference ROIs (air, skeletal muscle, and cortical bone) were compared via linear regression with asynchronous calibration using the ESP phantom, set as gold standard. ROIs were defined manually using ITK SNAP. Results were obtained in both calcium hydroxyapatite (CHA) and K_2HPO_4 units and all measurements were performed using the open-source Ogo library.
Results
The analyses revealed significant correlations ($p < 0.05$) between densities derived from all methods and the standard ESP calibration. The K_2HPO_4 phantom calibration exhibited the highest concordance, with a regression slope of 0.82 and an intercept of 9.90 ($R^2 = 0.998$). By contrast, although correlations remained significant, internal calibration methods had lower concordance, with decreased slope values (0.58 to 0.73) and increased intercept values, from 15.38 using three ROIs ($R^2 = 0.972$) up to 47.72 using five ROIs ($R^2 = 0.907$). In particular, internal calibration using five ROIs appeared to overestimate BMD values as compared to asynchronous calibration via ESP, especially in low density vertebrae.
Conclusion
Asynchronous calibration methods using different phantoms are highly concordant. By contrast, while representing a convenient option for the opportunistic screening of osteoporosis, phantomless calibration methods using internal references materials still yield suboptimal results and require further investigation to achieve comparable outcomes in clinical practice.

P122

CLINICAL CHARACTERISTICS OF PATIENTS WITH CHRONIC POST-TRAUMATIC PAIN: DATA FROM A PROSPECTIVE STUDY

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Chronic post-traumatic pain (CPT) is diagnosed when pain persists ≥3 months after injury. This is a serious pathology that significantly reduces the quality of life and ability to work of patients and is one of the predictors of the development of post-traumatic osteoarthritis.
The aim of the study was to evaluate the clinical features of CPTB after knee joint injury (CS).
Materials and methods. The study group included 103 patients (average age – 39.4±12.5 years, 51.5% of women). All patients suffered a CS injury with a diagnosed anterior cruciate ligament and/or meniscus injury and experienced pain of ≥4 on a numerical rating scale (HRH, 0-10) for ≥1 month after the injury. The patients' condition was assessed after 3 and 6 months. The intensity of pain during movement, at rest and at night, and impaired function were determined by heart rate. The questionnaires KOOS, EQ-5D, painDETECT, CSI, pain catastrophization, as well as HADS, FIRST and FACIT were used.
Results and discussion. After 3 months, the number of patients with CPT was 33 (32.0%). After 6 months, these patients had significantly more pronounced symptoms than patients with CS injury without CPTB (control, n=70). In the CPTB and control groups, the median pain during movement was 5.0 [4.0; 6.0] and 1.0 [0.0; 1.0], respectively, p<0.001; pain at rest – 2.0 [2.0; 3.0] and 0.0 [0.0; 1.0], p<0.001; pain at night – 2.0 [1.0; 3.0] and 0.0 [0.0; 0.0], p<0.001; KOOS score – 4.0 [1.0; 5.5] and 2.0 [1.0; 3.5], p<0.001; EQ-5D quality of life – 0.65 [0.52; 0.73] and 0.89 [0.69; 1.0], p<0.001; On the EQ-5D scale, 64.0 [50.0; 70.0] and 80.0 [70.0; 90.0], p<0.001; painDETECT score >12 was observed in 24.2 and 2.9% of cases, p<0.0037; depression ≥11 in 21.2 and 2.9%, p<0.001, anxiety ≥11 – in 24.2 and 4.3%, p=0.0038; CSI ≥40 – in 9.0 and 0%, p=0.03; pain catastrophization ≥30 – in 12.1 and 0%, p=0.005; FIRST ≥5 – in 6.1 and 0%, p=0.358; FACIT<30 – in 15.2 and 2.9%, p=0.004. After 6 months, there were statistically significant differences between the CPTB group.
Conclusion. 3 months after the injury, CS CPTB developed in 32.0% of patients. All of them had moderate/severe pain with impaired function and decreased quality of life, every 5th had symptoms of neuropathic pain, signs of depression and anxiety. Patients with CPTB showed marked changes in all sections of the KOOS questionnaire.

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FACTORS ASSOCIATED WITH THE DEVELOPMENT OF POST-TRAUMATIC PAIN IN PATIENTS AT RISK OF POST-TRAUMATIC OSTEOARTHRITIS

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The aim of the study was to identify the factors associated with the development of chronic post–traumatic pain (CPT) in patients with knee joint injury (COP).

Materials and methods. The study group consisted of 136 patients (51.5% women, age 38.7±12.4 years) who had suffered a CS injury with damage to the anterior cruciate ligament (ACL) and/or menisci. The inclusion criterion was the presence of pain in CS ≥4 on a numerical rating scale (HRH 0-10) for at least 1 month after the injury. Surgical intervention (PC plastic surgery, meniscus suture, meniscus resection, combined operations) was performed immediately after injury in 48.5% of patients. The incidence of CPTB (persistence of pain during movement ≥4 HRH after 3 and 6 months of follow-up) and factors related to the development of CPTB were evaluated. All patients were advised to use orthoses, exercise therapy, and nonsteroidal anti-inflammatory drugs on an "on-demand" basis.

Results. CPTB was detected after 3 months in 33.1%, and after 6 months in 32.4% of patients. Surgical treatment had no effect on the development of CPTB: odds ratio (OR): 1.241, 95% confidence interval (95% CI): 0.775–1.986 (p=0.474). The risk of CPTB after 6 months. It was statistically significantly higher in women, people with a high body mass index (≥30 kg/m2), initially severe pain (≥7 according to HRH), in the presence of initial signs of depression and anxiety (Hospital Anxiety and Depression Scale score ≥8) and highly probable central sensitization (score according to the Central Sensitization Inventory (CSI, Central Sensitization Inventory) ≥40): OR=2.152, 95% CI: 1.383–3.348 (p=0.002); OR=1.243, 95% CI: 1.054–1.465 (p=0.05); OR=3.567, 95% CI: 1,717–5,708 (p=0.001); OR=2,330, 95% CI: 1,070–5,726 (p=0.0044); OR=2,446, 95% CI: 1,220–4,905 (p=0.016); OR=2,584, 95% CI: 1,101–8,133 (p=0.043) accordingly.

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FACTORS DETERMINING THE DEVELOPMENT OF POST-TRAUMATIC PAIN AND POST-TRAUMATIC OSTEOARTHRITIS

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Injuries cause a systemic neurohumoral and behavioral response of the body aimed at repairing damaged tissues and correcting biomechanical disorders. However, in many cases, full-fledged repair is impossible: traumatic damage, resulting inflammation and degenerative processes (fibrosis, neoangiogenesis, heterotopic ossification) lead to severe structural changes and a progressive decrease in functional ability. The most common complications of injuries include chronic post-traumatic (PT) pain and PT osteoarthritis (OA). These complications are interrelated: pain (accompanied by stiffness and impaired function), which occurs in 10-50% of people who have suffered a joint injury, may indicate the formation of an early (pre-allergenic) stage of PT OA. The development of typical structural changes in PT OA after 10-15 years is noted after knee joint injury in more than 30% of patients. PT OA of large joints proceeds more aggressively, is more often accompanied by synovitis and requires endoprosthetics on average 10-15 years earlier than primary OA. Early diagnosis of PT OA is based on an analysis of the dynamics of clinical manifestations (primarily PT pain), visualization of early changes in joint structure (magnetic resonance imaging), as well as a study of the level of biomarkers of inflammation and bone-cartilage destruction. Genetic features that determine the chronization of inflammation and pain, as well as disorders of cartilage and bone tissue repair, are considered as additional risk factors for PT OA.

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TRABECULAR AND CORTICAL BONE LOSS POST TRANSPLANTATION: ASSOCIATION WITH EARLY BONE TURNOVER CHANGES

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Background: Bone loss and mineral abnormalities are common after kidney transplantation (KTx), increasing fracture risk and mortality. Traditional bone health assessments rely on biochemical markers of bone turnover and Dual-Energy X-ray Absorptiometry (DXA) to measure areal bone mineral density (aBMD). High-resolution peripheral quantitative computed tomography (HR-pQCT) provides additional insights into bone microarchitecture and volumetric bone density (vBMD) of cortical and trabecular compartments. This study evaluated bone turnover biomarkers, DXA, and HR-pQCT parameters over 1-year post-KTx, and assessed whether 3-month (3m) biomarker changes (Δdelta) predict 1-year (1yr) bone loss.

Methods: 75 patients were included in this prospective study (median age: 60.4 [52.1–65.8]), bone biomarkers (PTH, BALP, P1NP, TRAcP-5b, CTX, sclerostin) were measured at baseline (D0), 3m, and 1yr. DXA assessed aBMD at the lumbar spine (LS), hip, and radius, while HR-pQCT measured volumetric vBMD and bone microarchitecture at the distal radius and tibia.

Results: DXA revealed significant LS and femoral neck (FN) aBMD declines from D0 to 3m ($p < 0.03$), with partial LS recovery by 1yr. At 1yr, 30%, 29%, and 45% of patients showed significant

bone loss at LS, FN, and ultradistal radius (UD) sites (p<0.003). HR-pQCT showed early declines in total (Tt) and trabecular (Tb) vBMD, as well as trabecular bone volume fraction (BV/TV) starting at 3m. Cortical (Ct) vBMD and cortical thickness (CtTh) also began declining at 3m, with significant reductions in all parameters by 1yr. Multivariate analysis identified ΔBALP at 3m as an independent predictor of LS loss at 1yr (OR 1.025; p=0.003). Baseline sclerostin predicted Ct vBMD loss (OR 5.651; p=0.01), and ΔBALP at 3m independently predicted Tt vBMD loss at 1yr (OR 1.283; p=0.0009).

Conclusion: Bone loss after KTx begins rapidly, with trabecular and cortical compartments significantly affected within 1yr. Early changes in biomarkers, particularly BALP and sclerostin, predict future bone loss, highlighting the importance of biomarker and imaging monitoring to identify high-risk patients and improve bone health outcomes.

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IMPROVED TRABECULAR BONE SCORE ALGORITHM IN END-STAGE RENAL DISEASE PATIENTS: A COMPARISON WITH HR-PQCT DATA

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Purpose: Given the high fracture risk, non-invasive evaluation techniques for assessing bone fragility in chronic kidney disease (CKD) are crucial. The trabecular bone score (TBS) may provide valuable insights for treatment and follow-up decisions. A pre-market TBS software (version 4.0 (V4)), featuring an improved algorithm that adjusts for directly measured abdominal soft tissue thickness, is now available for clinical use. This version addresses limitations of earlier versions, such as V3, which relied on body mass index (BMI) as a surrogate for soft tissue thickness. The aim of this study is to assess if TBS can effectively reflect bone microarchitecture in end-stage renal disease (ESRD) patients, using high-resolution peripheral quantitative computed tomography (HR-pQCT) as the criterion, comparing versions V3 and V4 of TBS.

Methods: Seventy-five ESRD patients were included at the time of kidney transplantation (KTx). Areal bone mineral density (aBMD) was measured using dual-energy X-ray absorptiometry (DXA (Hologic)), and TBS was assessed from the L1-L4 region during DXA scans. Volumetric BMD (vBMD) and peripheral bone microarchitecture at the tibia and radius were analyzed using HR-pQCT. We evaluated the absolute differences in TBS between V3 and uncalibrated V4 versions, assessed their correlation, and calculated the intraclass correlation coefficient (ICC) to determine reliability and agreement between the two versions.

Results: In this ESRD cohort, median age was 60.4 [52.1 – 65.8] years old, and 70.7% were male. Mean BMI was 26.2 (± 4.6) kg/m^2, the median TBS score for V3 was 1.316 [1.256–1.401], while the median TBS for V4 was 1.305 [1.236–1.351]. A strong correlation was observed between TBS V3 and V4 (r = 0.85, p < 0.0001). The ICC for V3 and V4 was 0.80 (95% CI: 0.73–0.87), indicating good reliability.

V3 TBS showed only a modest correlation with aBMD at the total hip (TH) level (r = 0.283, p = 0.02), but not at other sites. TBS V4 maintained a negative correlation with age (r = -0.278, p = 0.02), similar to V3, and modest correlations with aBMD at the lumbar spine (LS) (r = 0.511, p < 0.0001), TH (r = 0.452, p = 0.0001), and femoral neck (FN) (r = 0.377, p = 0.001).

TBS V3 correlated modestly with vBMD parameters (r = 0.242–0.508, p < 0.04). Both versions demonstrated a negative correlation between TBS and trabecular separation (Tb.Sp) (r -0.368–0.550, p < 0.001), indicating that higher TBS values are associated with reduced trabecular separation, reflecting a more interconnected trabecular bone microarchitecture. TBS V4 showed higher correlations with trabecular microarchitecture; however, no, correlations were observed with cortical structural parameters (Ct.Po and Ct.Po.Dm) .

Conclusion: The updated algorithm, which adjusts for directly measured abdominal soft tissue thickness, further strengthened associations with trabecular bone microarchitecture. While correlations with cortical structural parameters were reduced.

Table TBS correlations with HR-pQCT parameters (n=73) V3 and V4 versions

	HR-pQCT parameters									
	Tt.vBMD	**Tb.vBMD**	**Ct.vBMD**	**BV/TV**	**Tb.N**	**Tb.Th**	**Tb.Sp**	**Tb.1/N.SD**	**Ct.Th**	**Ct.Po**	**Ct.Po.Dm**
Radius											
TBS V3	0.370 **(0.001)**	0.300 **(0.01)**	0.347 **(0.003)**	0.271 **(0.02)**	0.335 **(0.004)**	-0.049 (0.7)	-0.368 **(0.001)**	-0.445 **(0.0001)**	0.200 (0.09)	-0.281 **(0.02)**	-0.249 **(0.03)**
TBS V4	0.457 **(< 0.0001)**	0.508 **(< 0.0001)**	0.341 **(0.003)**	0.476 **(< 0.0001)**	0.506 **(< 0.0001)**	0.177 (0.1)	-0.529 **(< 0.0001)**	-0.523 **(< 0.0001)**	0.303 **(0.009)**	-0.186 (0.1)	-0.125 (0.3)
Tibia											
TBS V3	0.242 **(0.04)**	0.212 (0.07)	0.388 **(0.0007)**	0.167 (0.2)	0.360 **(0.002)**	-0.058 (0.6)	-0.379 **(0.001)**	-0.424 **(0.0002)**	0.131 (0.3)	-0.253 **(0.03)**	-0.061 (0.6)
TBS V4	0.378 **(0.0009)**	0.435 **(0.0001)**	0.389 **(0.0007)**	0.394 **(0.0006)**	0.526 **(< 0.0001)**	0.102 (0.4)	-0.550 **(< 0.0001)**	-0.564 **(< 0.0001)**	0.217 (0.07)	-0.162 (0.2)	0.008 (0.9)

Data are presented as correlation coefficients (r) and their corresponding p-values (p-value).
Significant correlations are in bold.

BV/TV: trabecular bone volume fraction; Ct: cortical; Ct.Th: cortical thickness; Ct.Po: intra-cortical porosity: Ct.Po.dm: cortical pore diameter; HR-pQCT: high resolution peripheral computed tomography scan; TBS: trabecular bone score; Tt: Total; Tb: trabecular; Tb.N: trabecular number; Tb.Th : trabecular thickness; Tb.Sp: trabecular separation; Tb.1/NSD: SD of 1/Tb.N inhomogeneity of network; vBMD: volumetric bone mineral density.

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OSTEOPOROSIS SCREENING IN POLYMYALGIA RHEUMATICA AND GIANT CELL ARTERITIS PATIENTS ON LONG-TERM CORTICOSTEROID THERAPY: A TERTIARY CARE ANALYSIS

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Objective: To evaluate osteoporosis (OP) screening and treatment in patients with polymyalgia rheumatica (PMR) and/or giant cell arteritis (GCA) on long-term glucocorticoid (GC) therapy.

Materials and Methods: A retrospective longitudinal study was conducted on PMR and/or GCA patients receiving ≥7.5 mg/day of prednisolone or equivalent for ≥3 months in a Rheumatology department from 2018 to 2024. Patients with prior OP diagnosis or treatment and fragility fracture history were excluded. Data collected included demographic and clinical information, FRAX assessment, bone mineral density (DXA scan), vertebral fracture assessment (spinal x-rays), and OP treatment. Screening and treatment were considered appropriate if performed within the first 6 months of GC therapy[1].

Results: We included 57 patients (49.2% PMR, 35.6% GCA, 11.9% both) with a mean age of 78 ± 8 years; 52.5% were female. Within the first 6 months of GC therapy, FRAX was performed in 31.6% of patients, DXA scan in 36.8%, and spinal x-rays in 15.8%. According to the 2022 ACR guidelines[1], 33.3% of patients had very high fracture risk, 12.3% high risk, and 15.8% moderate risk, totaling 61.4% of patients with an indication for treatment. Among those, 65.7% received anti-OP medication within 6 months and 20% after 6 months but during GC therapy; 31.4% never initiated treatment. Calcium and vitamin D supplementation were prescribed within 6 months in 91.2% of patients. Although 7% of patients were low risk and 31.6% not categorizable due to missing data, treatment was initiated in 25% and 38.9%, respectively, based on rheumatologist's opinion. The prescribed drugs were alendronate (38.6%), denosumab (14%), zoledronate (8.8%), risedronate (1.8%), pamidronate (1.8%) and teriparatide (1.8%).

Conclusion: OP screening and treatment in PMR/GCA patients on long-term GC were insufficient, especially in terms of early assessment. While most patients received calcium and vitamin D supplementation, the use of anti-OP medications did not align with recommendations. Improved strategies are needed to enhance OP management in this high-risk population.

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P128

PREDICTORS OF BONE MINERAL DENSITY AT THE TOTAL HIP IN OLDER IRISH ADULTS: RESULTS FROM THE TUDA STUDY

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Objectives

Several factors are known to influence bone mineral density (BMD) including age, sex, body mass index (BMI), genetic, lifestyle (diet, alcohol intake, smoking, exercise levels), vitamin D, medical conditions, and medications. We aimed to explore the predictors of hip BMD in older Irish adults.

Methods

Study participants were from the TUDA study of Irish adults aged >60 years who had total hip BMD measured by DXA. Exclusion criteria encompassed those on anti-resorptives or anabolic agents. Factors known to or with the potential to affect BMD (including medications) were explored in multinomial regression models with significant predictors reported.

Results

2343 participants, 60% female and mean age 69.1 years. Positive independent predictors of total hip BMD were body mass index ($p<0.0001$), diabetes ($p=0.002$), thiazide diuretics ($p=0.001$), statin use ($p=0.017$), while negative predictors were female sex ($p<0.001$), physical frailty ($p=0.005$), current smoking ($p=0.005$), current or long-term steroid use ($p=0.001$) and hyperparathyroidism (PTH >65 pg/ml) ($p<0.001$). Most of the variation (35%) in BMD was explained by three factors (age, sex, and BMI).

Conclusion

Genetics determines up to 70% of peak bone density which of itself may account for about 60% of the risk of osteoporosis in later life. Nonetheless, we identified that just three factors (age, sex, and BMI) account for about a third of the variation in total hip BMD in older adults. Similar to other studies, thiazides and statins were associated with higher BMD. While diabetes was associated with greater BMD, it is known to compromise bone quality and strength and also increase hip fracture risk.

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PREVALENCE OF OSTEOPENIA, OSTEOPOROSIS AND NORMAL OR HIGH BONE MINERAL DENSITY IN PATIENTS ATTENDING FOR DXA AT A BONE HEALTH UNIT

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Objectives
Measurement of bone mineral density (BMD) by DXA is recommended for adults with risk factors for low bone mass and in all females aged >65 and males aged >70 years. We aimed to assess the prevalence of osteoporosis, osteopenia and normal or high BMD in patients referred for DXA at our service.
Methods
Patients who had DXA at the total hip and/or lumbar spine were identified. Patients were classified into the diagnostic categories at each site based on T-scores: osteoporosis: mild (<- 2.5 to -2.9), moderately severe (-3.0 to -3.4) and severe (<-3.5), osteopenia (<-1.0 to -2.4), normal BMD (>-1.0 to <+2.4) and high BMD (>+2.5).
Results
BMD data was available for 9003 patients at the spine and 7410 at the total hip. Prevalence at the spine of osteoporosis was: mild (15.6%), moderately severe (12.2%), severe (16.9%), osteopenia (33.7%), normal BMD (20.8%) and high BMD (0.8%). The lowest spine T-score was -7.0 and the highest +6.8. Prevalence at the hip of osteoporosis was: mild (12.3%), moderately severe (5.8%), severe (6.7%), osteopenia (48.7%), normal BMD (26.5%) and high BMD (0.2%). The lowest hip T-score was -6.9 and the highest +4.6.
Conclusion
The majority of patients had low bone mass at the spine (78%) or hip (73%) reflecting the utility of DXA testing. Osteoporosis was less prevalent in the hip versus spine as reported elsewhere. Under 1% had high BMD (more common in the spine) and which in the majority of cases is known to result from osteoarthritic change.

P130

OSTEOARTHRITIS: PERSPECTIVE OF A POPULATION FACING BARRIERS TO ACCESS HEALTH SERVICES IN GUATEMALA

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Osteoarthritis (OA) is a prevalent chronic degenerative disease in Guatemala, a country marked by ethnic, cultural, and linguistic diversity. OA is a leading cause of permanent disability, significantly affecting quality of life due to delayed diagnosis and treatment. Access to healthcare is particularly unequal in northwestern regions, where poverty, low education levels, and limited medical resources exacerbate non-biological risk factors for chronic diseases.

Objective This study aimed to characterize the epidemiological, clinical, and therapeutic profiles of OA in Guatemala, focusing on preventive approaches and alternative therapies in diverse populations.

Material and Methods A retrospective, descriptive study was conducted using data from 201 medical records drawn from a population of N=319, calculated with a 95% confidence level (Z=1.96,p=0.5,q=0.5,E=0.05). Patients aged 15 years or older who received intra-articular platelet-rich plasma (PRP) therapy with a follow-up period of over two years were included. The therapy was performed by a specialist trained in arthroscopy, ensuring consistency. Data from 2017–2021 were analyzed using IBM SPSS software.

Results The knee was the most affected joint (81%), with a 1:2 male-to-female consultation ratio. Socioeconomic disparities were significant, and 37% were illiterate. The primary diagnostic method was X-rays analyzed with the Kellgren and Lawrence scale due to cost barriers to advanced imaging.

Table 1. Epidemiological, Clinical, Diagnostic, and Therapeutic Characterization.

Patient Characteristics	**N / (%)**		
Total patients	201 / (100%)		
Ethnic	**Maya**	**Mestizo**	**None**
	68 / (34%)	96 / (48%)	37 /(18%)
Gender (M/F)	72 (36%) / 129 (64%)		
Occupation			
-Housekeeper	76 / (38%)		
-Students	26 / (13%)		
-Others	99 / (49%)		
Age (Range 15-79)	Median 56, Mode 74, Standard deviation 17.41		
Literacy			
Yes	127 / (63%)		
No	74 / (37%)		
Clinical Characteristics			
Affected joint			
-Knee	162 / (81%)		
-Shoulder	31 / (15%)		
-Others	8 / (4%)		

Conclusions Health disparities, such as poverty and low education, impede timely OA diagnosis and treatment in Guatemala. PRP therapy, although emerging as a treatment option, is financially inaccessible for most patients, who primarily rely on anti-inflammatory drugs. Establishing specialized centers and preventive programs is essential to improving outcomes and mitigating the burden of OA in resource-limited settings.

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PLATELET RICH PLASMA AS BIOLOGICAL THERAPY IN WESTERN GUATEMALA: BENEFITS, SAFETY, AND TOLERABILITY

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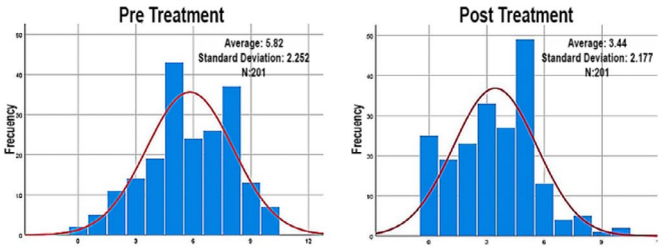
Osteoarthritis (OA) is a degenerative musculoskeletal disease characterized by geographic and population variability, significantly impacting patients physically, psychologically, and economically. Guatemala's ethnic, cultural, and linguistic diversity contributes to variations in OA symptomatology based on age, gender, and ethnicity, particularly in interior regions. Currently, there is no national clinical guideline for non-surgical OA management, and therapies with platelet-rich plasma (PRP) are still emerging.

Objective : This study aims to describe the clinical outcomes of PRP therapy in OA patients before and after treatment.

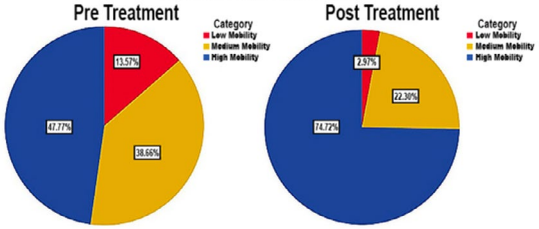
Material and Methods : This retrospective, descriptive study analyzed data from 201 patients meeting inclusion criteria, derived from a population of N=319 with a 95% confidence level (Z=1.96, p=0.5, q=0.5, E=0.05). Patients aged 15 years or older who received intra-articular PRP therapy over a two-year follow-up period were included. The therapy was administered by a trained arthroscopy specialist at the family medicine clinic of the National University of Guatemala, Quetzaltenango campus. Pre- and post-treatment pain scales and mobility function scores were analyzed. Medical records from 2017–2021 were reviewed using IBM SPSS software.

Results : PRP therapy demonstrated a significant reduction in pain, with average pre-treatment scores decreasing from 5.82 to 3.44 post-treatment. Improvements in pain and mobility were noted, particularly among patients classified as Grades I and II on the Kellgren and Lawrence X-ray scale. Patients tolerated the procedure well, with minimal reports of pain or inflammation managed through conservative measures. No adverse or infectious effects were observed during the study period.

Graph 1. Pain Scale Pre and Post-Treatment.



Graph 2. Mobility Function Percentages by Category Pre and Post-Treatment



Conclusions : This study is the first to report on PRP as an alternative therapy for OA in western Guatemala, providing an affordable option for patients unable to access arthroplasty. PRP treatment improved pain and mobility outcomes, particularly in early-stage OA. Patient education and physiotherapy are essential for optimizing results. Expanding access to PRP therapy in Guatemala could significantly enhance OA management, addressing the unmet needs of economically disadvantaged populations.

P132

PLATELET-RICH PLASMA: SEVEN YEARS OF EXPERIENCE IN OBTAINING, PREPARING, AND APPLICATION IN THE WESTERN REGION OF GUATEMALA

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Platelet-rich plasma (PRP) is increasingly utilized in osteoarthritis (OA) treatment due to its anti-inflammatory properties and ability to reduce proinflammatory biochemical effects in affected joints. While its bioregenerative mechanisms are not fully understood, PRP demonstrates positive clinical outcomes. In Guatemala, OA is prevalent, but limited healthcare access and economic constraints often preclude surgical interventions like arthroplasty. Despite the emerging use of PRP as an orthobiologic therapy, there is no national protocol standardizing its preparation and application.

Objective

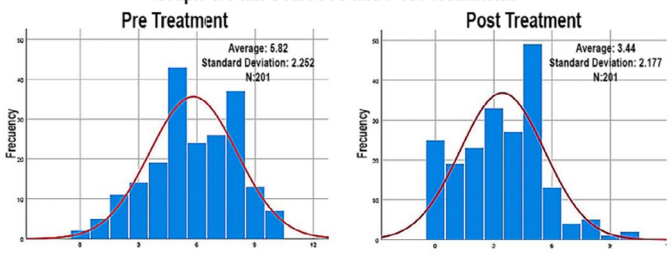
This study aims to describe the PRP preparation process, applica-

tion protocol, and outcomes in OA management.

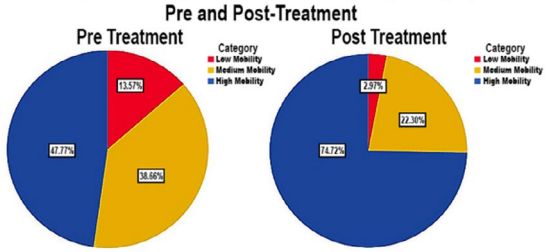
Material and Methods: A retrospective, descriptive study reviewed medical records of 201 patients treated with PRP from 2015 to 2021 at the family medicine clinic of the National University of Guatemala, Quetzaltenango campus. Patients aged 15 years or older, with a follow-up time exceeding two years, were included. PRP was obtained through a standardized protocol: 40 ml of peripheral venous blood was collected, divided into eight 5 ml glass tubes with 3.8% citrate anticoagulant, and centrifuged at 3,200 rpm for 15 minutes. The PRP fraction was extracted under sterile conditions, mixed with 1.8 ml of 10% calcium gluconate as an activator, and prepared for intra-articular injection. Platelet counts and quality were analyzed by trained laboratory personnel.

Results: The protocol yielded 9.5 ml of PRP with platelet levels 2–3 times higher than baseline. Pain scores decreased from a mean of 5.82 (SD: 2.252) pre-treatment to 3.44 (SD: 2.177) post-treatment. Mobility improved in 74.72% of patients based on functional range evaluations.

Graph 1. Pain Scale Pre and Post-Treatment.



Graph 2. Mobility Function Percentages by Category Pre and Post-Treatment



Conclusions: This is the first study in Guatemala to standardize PRP preparation and application for OA treatment. The technique, feasible in conventional clinics, emphasizes controlled antiseptic environments and thorough clinician training. PRP therapy offers a promising, cost-effective alternative for OA management, particularly in resource-limited settings. Further research into platelet quality and therapeutic frequency is recommended to optimize outcomes.

P133

CYTOLOGICAL ANALYSIS OF PLATELET MORPHOLOGY OBTAINED THROUGH PLATELET-RICH PLASMA (PRP) FOR THE TREATMENT OF OSTEOARTHRITIS

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The therapeutic application of Platelet-Rich Plasma (PRP) for osteoarthritis has shown promising regenerative potential. However, there is a notable lack of information regarding the morphological characteristics of platelets within PRP in this specific clinical context. Additionally, existing centrifugation methods rarely address their impact on platelet morphology and quality.

Objective:

This study is aimed to describe and analyze the cytological morphology of platelets obtained through a single centrifugation protocol for PRP preparation in patients with osteoarthritis.

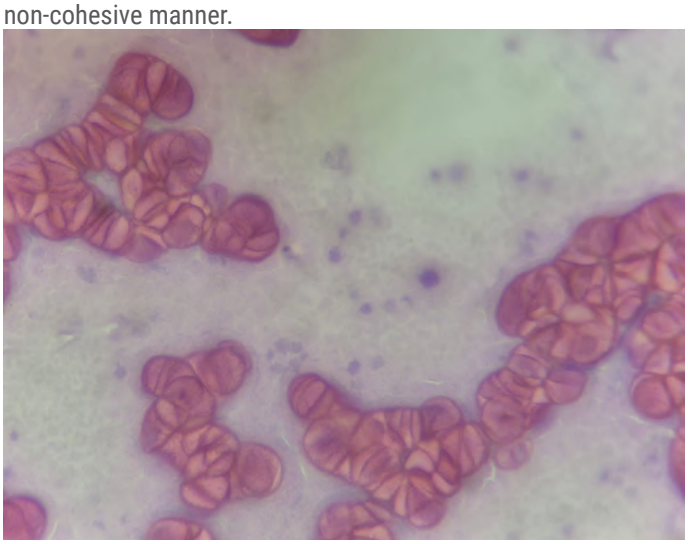
Methods

A prospective observational study was conducted using 54 blood samples obtained from osteoarthritis patients (Kellgren & Lawrence Grades I-III). Blood samples were centrifuged at 3200 rpm for 15 minutes. PRP blood smears were prepared, stained using Hemacolor, and evaluated under optical microscope by a professional histopathologist. Platelet morphology was assessed for size, granularity, membrane integrity, and aggregation. The platelet distribution patterns (scattered or clumped), and morphology (normal, diluted, or damaged) were documented.

Results

Out of the 54 samples analyzed, 83% (45/54) exhibited normal platelet morphology characterized by uniform size, intact membranes, and appropriate granularity, as illustrated in Figure 1. Hemodilution was identified in 15% (8/54) of the samples, leading to lower platelet concentrations, while 2% (1/54) presented damaged platelets with irregular shapes and disrupted membranes. Platelet distribution was predominantly scattered (72%), which is indicative of effective separation during centrifugation, while 15% of the samples showed clumping, potentially reflecting premature activation during processing.

Figure 1. Microscopic image at 100x magnification stained with Hemacolor shows agglomerated red blood cells in the background and multiple basophilic-stained platelets distributed in a non-cohesive manner.



Conclusion

The single centrifugation protocol at 3200 rpm effectively preserved platelet morphology in 83% of the samples, supporting its utility for PRP preparation. This study highlights the critical role of preserving platelet morphology in PRP quality and suggests that further research should be conducted to explore the relationship between platelet integrity and the release of growth factors. Developing standardized methodologies to assess and preserve platelet morphology will be vital to improving PRP preparation and ensuring its regenerative potential. The presence of hemodilution and damaged platelets in a subset of samples reveals areas for optimization in centrifugation protocols.

P134

CKD-MBD MANAGEMENT: RESULTS FROM A NATIONAL SURVEY ON BONE TURNOVER BIOMARKERS PRACTICE AND THERAPEUTIC STRATEGIES AMONG ITALIAN NEPHROLOGISTS

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Background and Objectives: In advanced stages of chronic kidney disease (CKD), the development of a mineral and bone disorder (CKD-MBD) can occur, characterized by laboratory abnormalities in the calcium-phosphorus-parathyroid hormone axis, bone alterations, and extraskeletal calcifications. This condition increases the risk of bone fractures, cardiovascular events, and mortality.

Methods: A national survey was conducted to examine the attitudes of clinicians regarding diagnostic methods and therapeutic strategies for preventing or treating CKD-MBD. From November 2022 to March 2023, 89 members of the Italian Society of Nephrology were asked to respond to 16 closed-ended questions. Data analysis was performed using STATA software.

Results: The survey revealed that laboratories typically fulfill the demand for the most commonly used biomarkers (calcium, phosphorus, and PTH). However, many laboratories do not routinely evaluate other biomarkers, such as FGF23 and bone turnover markers (e.g., bone ALP, P1NP, TRAP-5b). Management of secondary hyperparathyroidism (sHPT) is primarily guided by the KDOQI 2009 (47.2%) and KDIGO 2017 (43.8%) guidelines. PTH levels are measured every three months by 53.9% of clinicians, with 64% considering PTH levels as equally important as ALP levels in predicting fractures. Regarding therapeutic strategies, vitamin D administration (cholecalciferol 27-37.1%, calcifediol 9-12.4%, calcitriol 47.2-53.9%) and its analogues (paracalcitol 21.3-30.3%) were used by our cohort. Antiresorptive agents, such as alendronate (2.2%-23.6%) and denosumab (22.5%-28.1%), were prescribed with varying frequencies across different stages of CKD. Notably, denosumab was widely used across all CKD stages, indicating a confident approach to its use despite the potential risk of hypocalcemia, a known side effect.

Conclusion: Although the survey revealed that the use of biomarkers and bone turnover markers in the management of CKD-MBD is suboptimal, it also highlighted a proactive approach among Italian nephrologists towards the treatment of skeletal fragility in CKD patients.

Figure 1. Availability of markers from reference laboratory.

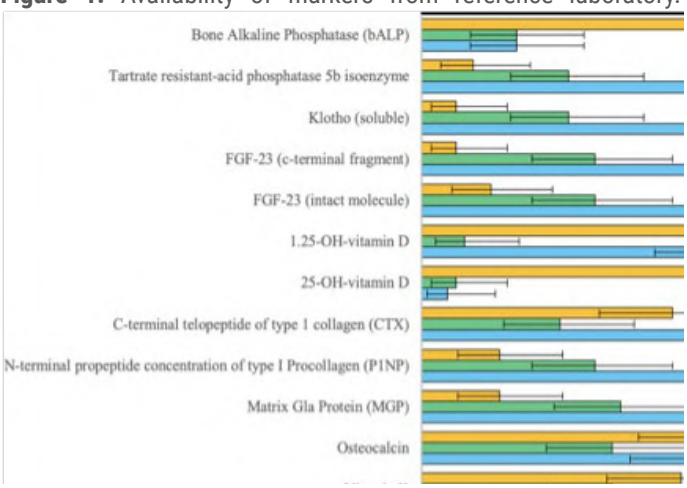
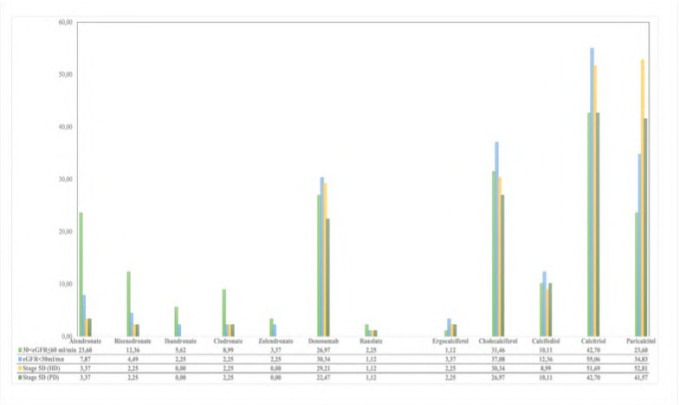


Figure 2. Vitamin D and Anti-Resorptive Agents Use among Italian Nephrologists.



P135

VITAMIN K DEPENDENT PROTEINS AND BONE QUALITY IN THE FIRST YEAR AFTER KIDNEY TRANSPLANTATION

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Objective. Chronic kidney disease (CKD) often leads to mineral and bone disorders (CKD-MBD), which compromise bone quality and increase fracture risk. These bone complications frequently persist after kidney transplantation (K-Tx), primarily due to the lingering effects of pre-existing CKD-MBD. Our aim was to evaluate CKD-MBD biomarkers, bone turnover markers, vitamin K-dependent protein (VKDP) levels, and bone microarchitecture using HR-pQCT at the time of K-Tx (T0) and 12 months post-transplant (T2). The main objective was to establish the association between VKDPs and HR-pQCT-derived bone quality parameters.

Methods. We analyzed data from a cohort of 61 K-Tx patients: mean age 50.9 ± 13.3 years, 67% male, 25 patients (41%) underwent pre-emptive K-Tx, median dialysis duration 12 months (36 patients, 59%), diabetes prevalence 25%, fracture history 32%. The median cumulative total steroid dose was 1194 mg of prednisone equivalent. The following CKD-MBD serum biomarkers and bone turnover markers were measured: 25(OH)D, 1,25(OH)2D, PTH, Bone ALP, P1NP, CTX, cFGF23, Klotho, IGF1, phosphate, calcium. Vitamin K-related proteins included Bone Gla Protein (BGP), undercarboxylated BGP (ucBGP), Matrix Gla Protein, and dephosphorylated-uc MGP (dp-ucMGP). In addition to HR-pQCT of the tibia and radius, DEXA scans of the lumbar spine, hip, and radius were performed at baseline and 12 months post-K-Tx. Spearman correlation (ρ, rho) was assessed between the percentage change in VKDPs, bone biomarkers (PTH, cFGF23), bone turnover markers (P1NP, CTX, Bone ALP), and the percentage change in HR-pQCT parameters of the tibia and radius.

Results. Significant improvements were observed in all CKD-MBD biomarkers and bone turnover markers 12 months post-transplant, except for Bone ALP and Klotho levels. PTH decreased from 100 to 27 ng/L, and CTX from 1524 to 246 pg/ml (**Figure 1**). VKDP levels also showed significant improvement. The prevalence of vitamin K deficiency, based on a cut-off level of uc-BGP ≥ 4.5 ng/ml, decreased from 77% to 32% ($p < 0.01$, Delta % [median and IQR]: -55.22 [-69.50, -24.33]). Using a cut-off level of dp-uc MGP > 500 pmol/L, the prevalence of vitamin K deficiency decreased non-significantly from 97% to 79% ($p = 0.06$). Our findings indicate significant inverse correlations between % Δ uc-BGP and Radius Total Volumetric BMD ($r = -0.37$, $p < 0.05$), Failure Load ($r = -0.51$, $p < 0.05$), and Stiffness ($r = -0.49$, $p < 0.05$). However, correlations between % Δ uc-BGP and Tibial parameters, including Tibial Total Volumetric BMD ($r = -0.08$), Failure Load ($r = -0.11$), and Stiffness ($r = -0.11$), did not reach statistical significance ($p > 0.05$) (**Figure 2**).

Conclusion. Our data confirm an improvement in vitamin K status one year after K-Tx. Additionally, the inverse correlation between ucBGP and bone quality parameters assessed by HR-pQCT underscores the crucial role of BGP in bone health. To our knowledge, these are the first reported data in the literature.

Figure 1. Significative changes of bone turnover markers.

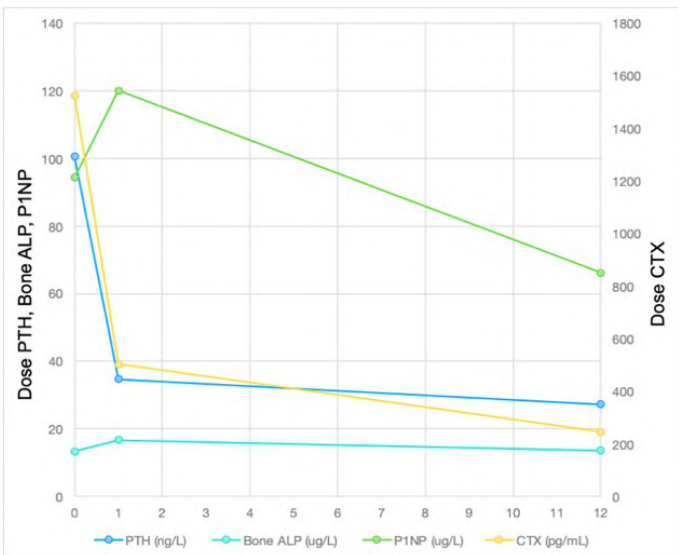
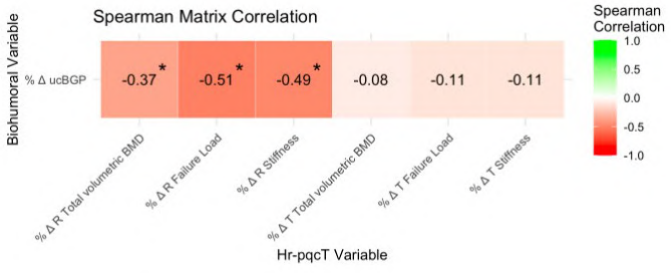


Figure 2. Spearman Matrix Correlation.



P136

FRACTURE LIAISON SERVICE – PATIENT REPORTED DIGITAL HEALTH REPORT AND FOLLOW UP

A. D. Djuv[1], O. H. Horpestad[1], H. N. Nysted[1]

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Objective(s): "Quality register for bone fractures and osteoporosis assessment" (BeinOP) was established in 2021 at the FLS (Fracture Liaison Services) clinic in Stavanger, Norway. Capturing data from structured health record (SHR) to FLS-database was implemented at Stavanger University Hospital (SUH) [1]. To further reduce the FLS nurses` workload both in registration of patients' health prior to FLS assessment and the 3 months follow up of compliance for those starting on oral anti-osteoporosis drug, digital reporting from the patients was warranted. Could the patients report their health information prior to the assessment digitally at home to the health record? Secondly, could a digital home report replace the medical 3 months phone call follow-up?
Methods: Digital patient health reports were developed together with patients' representatives. Software was approved by the Norwegian health authorities. An integration between the national health platform and digital hospital SHR was made. Patients were informed by SMS to login on their smart phone, PC or tablets to the online health status report and deliver it to the hospital SHR. The 3 months follow up were conditioned by the nurse choosing "oral drugs" in the SHR. Patients were included at the FLS-clinic at Stavanger University Hospital in Norway registered in BeinOP database (ID1440) between 01. June 2022-30. September 2024.
Results: 5957 patients were included. 78% were women and median age of 69 years (IQR 61-77). 85% patient replied to the digital health report prior to FLS assessment. 1393 started on per os treatment (alendronate). At the 3 months follow-up the response rate was 37%. Of these, 75% reported to use the drug as prescribed without any side effects, 9% reported side-effects, 4% reported side-effects and had stopped, 5% had never started advised by their dentist and 8% had not yet used the drug prescribed.
Conclusion: The digital patients health report prior to FLS assessment gave excellent response rate. The follow up for the patients after starting p.o. treatment saved telephone calls for the nurses; however, the response rates were low and improvement is in process.
Disclosures: AD has received speaking fees from Amgen and UCB Pharma

References:
1. Djuv, A; BMJ Open Qual, 2023. 12

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SOMATOSENSORIAL AND NEUROLOGICAL ALTERATIONS DURING FELINE AND CANINE OSTEOARTHRITIS

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Objective: To determine whether sensitisation correlates with deficits in stimulus transmission and integration, or with co-morbidities. The hypothesis was that hypersensitised individuals were at greater risk of nerve conduction damage, sensory changes and cognitive decline.
Material and methods: Healthy (H) and osteoarthritic (OA) adult neutered cats (n=6 H, n=12 OA) and dogs (n=4 H, n=8 OA for nerve conduction) were assessed for peripheral (paw withdrawal threshold, PWT) and spinal (response to mechanical temporal summation, RMTS) sensitisation, with lower values meaning higher sensitisation. Nerve conduction (motor and sensory) of tibial and ulnar nerves was tested under standardised general anaesthesia. Stimulus integration was recorded with somatosensorial (SEP), auditory (AEP) and visual (VEP) evoked potentials under dexmedetomidine sedation. Sensorial perception was evaluated for olfaction (binary behavioural response – repulsion to unpleasant odour) and audition (number of high frequency sound repeated stimuli). Statistical analyses were based on data distribution (α=0.05).
Results: The OA cats or dogs had a decrease by more than 20% for their tibial and ulnar nerve amplitudes and velocities compared to H (P<0.05). The OA cats had higher SEP and AEP latencies and amplitudes (P<0.036), but lower VEP (P<0.046) compared to H. The PWT was positively correlated with nerve conduction velocity (r>0.48, P<0.045) and VEP (ρ=0.747, P=0.004) but negatively with SEP (ρ=-0.428, P=0.037) and AEP (ρ=-0.800, P=0.003) latencies. The RMTS score was positively correlated with VEP latencies (ρ=0.589, P=0.042) and negatively with SEP (ρ=-0.484, P=0.017), smell aversion (ρ=-0.653, P=0.026) and auditory stimulation (ρ=-0.811, P=0.002).
Conclusion: Nerve conduction alterations were reported for OA individuals. Hypersensitised cats were characterised by a decrease

in nerve conduction amplitude and velocity, increase in SEP and AEP latencies. They were more repulsed by unpleasant smell and less sensitive to repeated repulsive sound. Chronic OA pain correlates with transmission alteration up to change in perception of sensory stimuli, raising the concern of its classification and therapeutical management.

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HIGH INCIDENCE OF FIBROMYALGIA (FM) MISDIAGNOSED AS AXIAL SPONDYLARTHRITIS (SPA): IMPORTANT INSIGHTS FROM AN ANALYSIS OF 34 PATIENTS IN ALGERIA

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Background/Purpose:
Both fibromyalgia (FM) and axial spondyloarthritis (SpA) are associated with pain, though the types of pain experienced differ. Axial SpA is typically marked by inflammatory back pain, whereas FM is characterized by widespread pain throughout the body. In FM patients, sleep disturbances—often resulting from anxiety or depression—can intensify back pain at night, leading it to be mistakenly identified as inflammatory back pain. Consequently, some FM patients are misdiagnosed with axial SpA.

Objectif
The goal of this study is to improve understanding of the modified American College of Rheumatology (ACR) 2010 diagnostic criteria for FM, enhance the diagnostic accuracy for axial SpA, and reduce the incidence of misdiagnosing FM as axial SpA.

Methods
Clinical data were collected from 34 patients diagnosed with primary FM, who had previously been misdiagnosed with axial SpA at tertiary hospitals in Algeria. The re-diagnosis was made using the modified ACR 2010 criteria. Each patient underwent assessment using the Widespread Pain Index (WPI) and Symptom Severity (SS) scale from the modified ACR 2010 guidelines, as well as tests for serous C-reactive protein levels, erythrocyte sedimentation rate (ESR), HLA-B27 status, and imaging of the sacroiliac joints

Results
The cohort consisted of 24 females (70.58%) and 10 males (29.41%), all reporting widespread pain, primarily in the spine. No peripheral arthritis, enthesitis, dactylitis, or limited spinal motion was observed. The median WPI was 5. (range: 3.0-8.0), and the SS score was 8.654 ±1.954. The median C-reactive protein level were 4.31±1.69mg/l. The median ESR was 10.0 (range: 3.0-19.0) mm/1h. HLA-B27 positivity was found in 17.64 % of cases. Ten patients (29.41%, all females) had osteitis condensans ilii detected by CT and MRI, while 15 had normal sacroiliac CT scans, 17 had normal sacroiliac MRI results, and the remaining 11 had normal CT and MRI findings.

Conclusion
The modified ACR 2010 criteria for FM have replaced the tender point count with the WPI and SS scale, and placed more emphasis on anxiety and depression in the diagnostic process. However, in clinical practice in China, FM is still often misdiagnosed as axial SpA, due to two main factors: first, an over-reliance on the tender point counts from the ACR 1990 criteria for FM, and seconde, a failure to prioritize inflammation in the diagnosis of axial SpA. To improve diagnostic accuracy for both FM and axial SpA, it is crucial to thoroughly assess somatization related to anxiety and depression rather than relying solely on tender point counts for FM diagnosis, and emphasize the identification of inflammatory signs in axial SpA diagnosis, such as peripheral arthritis, enthesitis, dactylitis, definitive sacroiliitis on imaging, and elevated inflammatory biomarkers like C-reactive protein and ESR.

P139

OUTCOMES OF ARTHRALGIA IN ALGERIAN PATIENTS WITH PSORIASIS : PREDICTORS OF PROGRESSION TO PSORIATIC ARTHRITIS

A. Djebbari[1], A. Gouder[1], S. Benedjma[2], A. Beguiret[3]

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Objective The progression from psoriasis (PsO) to psoriatic arthritis (PsA) offers a distinctive opportunity to identify individuals at higher risk of developing PsA, allowing for the implementation of preventive interventions.the aim of this study is to estimate the prevalence of Arthralgia with Psoriasis progression to PsA in a large cohort of Algerian patients and to evaluate the one-year incidence of PsA in those patients by analyzing clinical, laboratory, and imaging factors as predictors.

Methods This prospective cohort study included patients from Algerian PURE 4 cohort , aged 18 years and older with psoriasis and complaining of inflammatory arthralgia. At baseline, data were collected from laboratory tests, X-rays, ultrasound (US) with power Doppler (PD), and clinical interviews. Additional information such as sociodemographic data, clinical assessments (global VAS, joint count, HAQ), and clinical evaluations were also gathered. Evaluators for laboratory, imaging, and clinical assessments were blinded to each other's results. The presence of family history (FH) of PsA were noted. These patients were followed up for one year to determine if they developed PsA. Statistical analysis included descriptive statistics, Chi-square test, Fisher's exact test, Student's T test, and Mann Whitney test, along with a multivariate logistic regression where the dependent variable was the diagnosis of PsA at the one-year follow-up.

Results The study enrolled 66 patients with psoriasis +arthralgia between July 2019 and september 2022. Of these patients, 21 (31.8%, 95% CI: 15-39) developed PsA within one year. The clinical, laboratory, and imaging characteristics of Psoriasis + Arthralgia patients who progressed to PsA were compared to those who did not, as shown in Table 1 (univariate analysis). Among the Psoriasis + Arthralgia patients who progressed to PsA patients, 3 had nail PsO, 11 had synovitis detected by PDUS, 10 had enthesitis, and 7 had Family History of PsA. A longer duration of psoriasis was associated with a higher risk of developing PsA (median years: 12.1 vs. 4.2). Multivariate analysis identified key predictors for progression to PsA: the combination of Family History

of PsA(OR: 4.12; 95% CI: 1.21-7.32), a higher number of tender joints (OR: 3.153; 95% CI: 1.39-6.21), synovitis detected by Power DoplerUS (OR: 9.32; 95% CI: 1.9-21.36), and nail psoriasis (OR: 4.91; 95% CI: 2.3-6.89).

Table 1 characteristics of 2 groups progressed or not to PsA after one years of folow up

Characteristic	Progressed to PsA (n=21)	Did Not Progress to PsA (n=45)	p
Age	42.2	49.3	0.26
Female	10	20	0.12
Nail Psoriasis	3 (14.3%)	7 (13.9%)	0.003
Synovitis Detected by Power Doppler US	11 (52.4%)	5 (11.1%)	0.002
Enthesitis	10 (47.6%)	6 (20%)	0.02
Family History of PsA	7 (33.3%)	2 (4%)	0.001
Duration of Psoriasis (Median years)	12.1	4.2	0.02
PASI	12.3	12.9	0.37
Number of Tender Joints	2.31	0.3	0.03

Conclusion: In our cohort, 31.8 % of patients with Psoriasis+Arthralgia were at risk of developing PsA due to the presence of Family History of PsA and nail involvement at the one-year follow-up. The primary predictive factors for the progression to PsA were ultrasound findings (synovitis), the combination of a higher number of tender joints, and a longer duration of psoriasis.

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LACK OF CORRELATION BETWEEN MRI CHANGES AND BASDAI SCORE IN ALGERIAN PATIENTS WITH ANKYLOSING SPONDYLITIS

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Objective The Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) is commonly used to assess disease activity in Ankylosing Spondylitis (AS) . BASDAI score greater than 4 is often used as a criterion for initiating anti-TNF therapy. Previous studies have shown a weak correlation between BASDAI scores and MRI findings. This study aimed to evaluate the correlation between BASDAI scores and MRI changes indicative of spondyloarthritis and to compare the clinical and radiological data of AS patients.

Methods A retrospective analysis was conducted on AS patients coming from different departments of the country. Clinical data, including HLA-B27 status, extra-articular manifestations, family history of AS, and CRP levels, were obtained from online systems and clinic letters. The patients' records were reviewed to check if they had undergone an MRI of the sacroiliac joints and had a BASDAI score recorded at the time of MRI. Statistical analysis was performed using the MedCalc calculator.

Results A total of 62 patients were included in the analysis, with a mean age of 43.1 ± 21.6 years (50 males, 12 females). The mean BMI was 26.39, the mean Shober index was 12.6±2.0 .Six (9.6%)patients undergoing peripheral arthritis, however19 patients (31.7%) developpes Extra-articular manifestation (uveitis, colitis,psoriasis) .The mean BASDAI score was 4.3 ± 2.7, and the mean CRP level was 13.21 ± 23.4 (n CRP 5.5). From all population, n = 20 (35.5%) of patients were HLA-B27 positive, 41 patients (66.1%) had inflammatory back pain. Of the 62 patients, 60 underwent a sacroiliac MRI scan, which was reviewed to assess the presence of disease. Two factors were statistically significant when comparing patients with active versus inactive lesions on MRI: high CRP level(p<0.001) (Table 1).

Table 1 : Clinical and imaging characteristics of the 62 patients

Parameter	Value
Total Number of Patients	62
Mean Age (years)	43.1 ± 21.6
Male/Female Ratio	50 males, 12 females
Mean BMI(kg/m^2)	26.39
Mean Shober Index(cm)	12.6 ± 2.0
Peripheral arthritis	6 (9.6%)
Extra-articular manifestation	19 (31.7%)
Mean BASDAI Score	4.3 ± 2.7
Mean CRP Level(mg/l)	13.21 ± 23.4 (Median CRP: 5.5)
HLA-B27 Positive n(%)	20 (35.5%)
Number of Patients with Sacroiliac MRI	60
Factors Statistically Significant for Active vs Inactive Lesions on MRI	High CRP level (p<0.001)

Conclusion Contrary to the literature our data suggest a discordance between the BASDAI score and the severity of inflammation observed on MRI. Only CRP level showed a correlation with MRI-detected disease activity. There were no significant differences in clinical features, including HLA-B27, between patients with active versus inactive MRI findings.

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PREDICTIVE FACTORS OF RADIOGRAPHIC PROGRESSION IN EARLY PSORIATIC ARTHRITIS: FINDINGS FROM A SCREENING ALGERIAN COHORT

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Objective

Chronic joint inflammation in psoriatic arthritis (PsA) is linked to radiographic damage. Advances in diagnosis and treatment strategy in this rheumatism have not prevented rapid and aggressive structural progression. The goal of this study was to investigate baseline clinical factors that could predict radiographic progression over time.

Methods
Data obteined from the screening PURE 4 Algerian cohort ; a cohort of patients with recently diagnosed PsA. Radiographic changes were measured using the modified Total Sharp/van der Heijde Score (mTSS) for PsA. Univariable and multivariable mixed-effects negative binomial regression analyses were employed to identify baseline predictors of radiographic progression.
Results
The study enrolled 53 patients with early PsA, with radiographs of the hands and feet taken at four time points (baseline, first, second, and third years). The progressive group (n=15) exhibited a higher mTSS at diagnosis compared to the non-progressive group (n=38) (12 [2–26] vs. 1 [0–3]). The progressive group was significantly older (52 [10] vs. 42 [9], p=0.001) and had a higher rate of swollen joints (84% vs. 52%, p=0.023) at diagnosis. Multivariable analysis revealed that age (p=0.001), male sex (p=0.023), and baseline mTSS (p=0.002) were key predictors of radiographic progression. In the progressive group, baseline DAPSA (p=0.006) and swollen joint count (p=0.034) were also significant predictors.

Table 1: Comparison between the progressive and non-progressive groups at diagnosis and significant predictors for radiographic changes over time.

Characteristic	Progressive Group (n=15)	Non-Progressive Group (n=38)	P
Mean mTSS at Diagnosis	12 (2–26)	1 (0–3)	<0.001
Age (Mean ± SD)	52 (10)	42 (9)	0.001
Male (%)	9 (60%)	25 (65.7%)	0.023
Baseline DAPSA (Mean ± SD)	16.23	7.12	0.006
Baseline Swollen Joint Count	6	1	0.034
Baseline Tender Joint Count	8	1	0.002

Conclusion
In patients with early PsA, radiographic progression was minimal under current treatment protocols. The study highlighted that older age and baseline radiographic damage were significant predictors of progression, while female sex appeared to provide a protective benefit. Furthermore, both the disease activity score and the swollen joint count were found to be predictive of radiographic changes over time in those with progressive disease.

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RADIOGRAPHIC FINDINGS IN EARLY PSORIATIC ARTHRITIS PATIENTS: LESSONS LEARNED FROM AN 18-MONTH FOLLOW-UP OF ALGERIAN PATIENTS

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Objective The duration and severity of joint inflammation in psoriatic arthritis (PsA) significantly impact radiographic outcomes, which can serve as a prognostic factor for the disease's progression.To examine radiographic changes in early psoriatic arthritis (EPsA), defined as less than 2 years from symptom onset.
Methods
Patients with EPsA were assessed by a rheumatologist. Standard clinical and laboratory evaluations were performed, including conventional radiographs of peripheral joints (hands, wrists, feet) and sacroiliac joints. Radiographic changes were categorized as normal, abnormal-not clinically relevant, and abnormal-clinically relevant.
Results
Forty-three patients with EPsA (mean disease duration 1.0 [0.8] years) were included in this study. The most common joint involvement was polyarticular in 26 patients (60.4%), with either symmetric or asymmetric presentation. Distal Interphalangeal (DIP) joint involvement was present in 18 patients (41.8%). Among the 43 patients, radiographic damage was identified in 12 (27.9%) patients, with 6 (50%) showing changes in two joints and 2 (16.1%) in three or more joints. Most of these patients (9 or 75%) experienced joint damage within the first year of symptoms. Radiographic changes observed included new bone formation (often interpreted as degenerative by radiologists), mild-to-moderate joint space narrowing, and both marginal and central bone erosions. Clinically relevant abnormalities were seen in 6 (50%) patients' hands (10 or 71.4% had involvement in both hands), 4 (33.33%) in feet, 3 (25%) in sacroiliac joints, and 2 (16.1%) in wrists.After an 18-month follow-up, 7 (16.6%) of the 43 patients developed new radiographic signs. Radiographic progression, including worsening joint erosion and space narrowing, was seen in 4 (33.33%) of the 12 patients with initial radiographic involvement, while 8 (66.66%) patients had stable radiographic findings.

Table 1: Radiographic Findings in Early Psoriatic Arthritis (EPsA) Patients

Characteristic	Result
Total number of patients	43
Mean disease duration (SD)	1.0 (0.6) years
Most common joint involvement n(%)	Polyarticular (26, 60.4%)
DIP joint involvement n(%)	18 (41.8%)
Radiographic damage n(%)	12 (27.9%)
Number of joints affected n(%)	2 joints (6, 50%), ≥3 joints (2, 16.1%)
Radiographic changes within 1st year of symptoms	9 patients (75%)
Types of radiographic changes	New bone formation, joint space narrowing, bone erosions
Hands n(%)	6 (50%) (10, 71.4% in both hands)
Feet n(%)	4 (33.33%)
Sacroiliac joints n(%)	3 (25%)

Characteristic	Result
Wrists n(%)	2 (16.1%)
Follow-up duration	18 months
New radiographic signs during follow-up n(%)	7 (16.6%)
Radiographic progression during follow-up n(%)	4 (33.33%) with worsening joint erosion and space narrowing
Stable radiographic findings n(%)	8 (66.66%)

Conclusions
Radiographic damage was detected in 27.9% of EPsA patients, with the majority acquiring damage within the first year of symptom onset. The increased frequency of axial and DIP joint involvement aligns with previous studies, which show these as common sites in PsA. Radiographic progression was observed in only 30% of patients, underscoring the importance of early diagnosis and intervention in EPsA

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GENDER DIFFERENCES IN CLINICAL AND SONOGRAPHIC MANIFESTATIONS IN ALGERIAN PATIENTS FOLLOWED FOR PSORIATIC ARTHRITIS

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Objective
Psoriatic arthritis (PsA) is a complex, multi-domain condition that primarily impacts the musculoskeletal (MSK) system. It occurs in approximately 30% of individuals with psoriasis, with an equal distribution between males and females. Enthesitis is recognized as a central feature of PsA. Evidence suggests that sex may influence the clinical and radiographic presentation of PsA differently. However, research on sex-based differences in ultrasound (US) findings in PsA patients remains limited. To examine sex-related variations in sonographic findings among individuals with psoriatic arthritis (PsA).

Methods
The study comprised consecutive patients diagnosed with PsA according to the CASPAR (Classification for Psoriatic Arthritis) criteria. Participants underwent clinical and physical assessments, followed by an extensive ultrasound (US) examination using both greyscale and Doppler techniques. The US evaluation included 52 joints, 40 tendons, and 14 enthesis points (Modified Madrid Sonographic Enthesis Index [MASEI] plus lateral epicondyles), conducted by a skilled sonographer who was blinded to the clinical information. The US scoring system was based on semiquantitative assessments of synovitis, tenosynovitis, and enthesitis. Enthesitis was categorized into inflammatory lesions (such as hypoechogenicity, thickening, bursitis, and Doppler activity) and structural lesions (such as enthesophytes/calcifications and erosions).

Results
A total of 49 patients were included in the study: 29 males and 21 females. Mean age was 51.23±23.1years, BMI was 29.1±5.3. Males had higher Psoriasis Area and Severity Index (PASI) scores (P = 0.04), long duration of psoriasis (P = 0.03), higher LEI score (P = 0.02) , mean swollen joint counts (P = 0.04), and CRP level (P = 0.02) . The overall US score, as well as the synovitis and tenosynovitis subcategory scores, were comparable between the sexes. However, the total enthesitis score and the inflammatory enthesitis score were significantly greater in males compared to females (P = 0.02 and P = 0.01, respectively). Males also had a higher frequency of hypoechogenicity, thickening, and enthesophytes compared to females (P < 0.03). Multivariate logistic regression analysis showed that male sex was associated with a higher inflammatory enthesitis score on US compared to females (odds ratio 1.96, P = 0.03).

Characteristics	Female, n = 21, Mean (SD)	Male, n = 29, Mean (SD)	P-Value
Age, yrs	51.39 (13.40)	53.22 (12.45)	0.51
BMI	28.23 (4.71)	29.10 (4.32)	0.45
PsO duration, yrs	10.23 (7.21)	12.11 (9.25)	0.03
PsA duration, yrs	10.63 (11.11)	11.86 (11.89)	0.36
TJC	8.19 (9.97)	8.89 (10.10)	0.62
SJC	0.83 (1.76)	1.73 (3.66)	0.04
LEI	1.37 (1.49)	0.76(1.21)	0.02
SPARCC enthesitis	2.17 (3.81)	3.13 (3.21)	0.06
PASI	1.03 (2.12)	2.03 (4.45)	0.04
Pain	6.36 (3.91)	4.23 (2.63)	0.91
CRP, mg/L	6.28 (4.61)	9.13 (8.23)	0.02
DAPSA	19.02 (12.63)	18.36 (14.23)	0.56

Conclusion
In the male sex, this rheumatism appears more severe in terms of skin damage, swollen joints and enthesitis, whereas in terms of ultrasound, enthesitis is more inflammatory in men and is correlated with the clinical evaluation.

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CALCIUM ISOTOPES AS A NOVEL BIOMARKER FOR VASCULAR CALCIFICATION IN CKD: IMPLICATIONS FOR OSTEOPOROSIS MANAGEMENT

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Calcium balance is intricately linked to both bone health and vascular health. In chronic kidney disease (CKD), abnormal calcium

metabolism contributes significantly to the development of vascular calcification, a major cardiovascular risk factor. While osteoporosis is a common comorbidity in CKD, the impact of vascular calcification on bone health remains an area of active investigation.
This study explored the potential of calcium isotope analysis as a non-invasive biomarker for vascular calcification in CKD patients. A cohort of 78 participants, including healthy controls, CKD patients, and those on dialysis, underwent comprehensive assessments, including vascular function tests and serum biomarker analysis.
Results demonstrated significant differences in serum calcium isotope compositions across the groups ($p<0.01$). Receiver operating characteristic (ROC) curve analysis revealed high diagnostic accuracy for serum Ca isotopes in detecting medial calcification (AUC = 0.818, $p<0.01$).
These findings have important implications for osteoporosis management in CKD patients. Accurate assessment of vascular calcification may provide valuable insights into systemic vascular health and may be a useful marker in identifying individuals with CKD at potentially increased risk for adverse health outcomes, including fractures. The use of calcium isotope analysis offers a promising approach for early detection and monitoring of vascular calcification in this vulnerable population. Further research is warranted to investigate the potential interplay between vascular calcification and bone health in CKD, and to explore the clinical utility of calcium isotope analysis in improving osteoporosis management outcomes.

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PROPHYLAXIS OR PATIENCE? MANAGING THE UNFRACTURED FEMUR IN ATYPICAL FEMORAL FRACTURES

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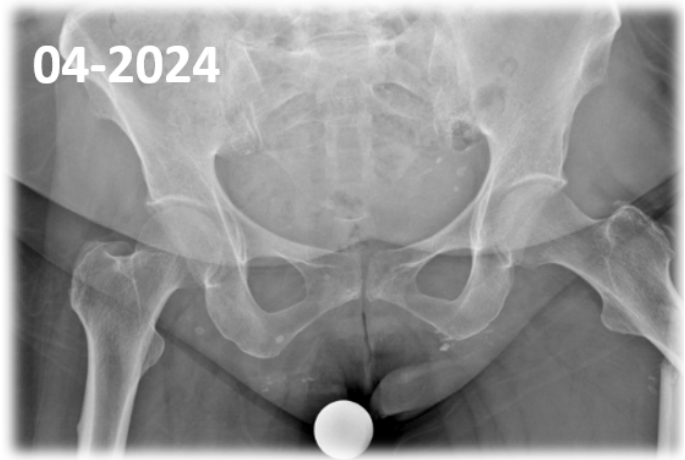
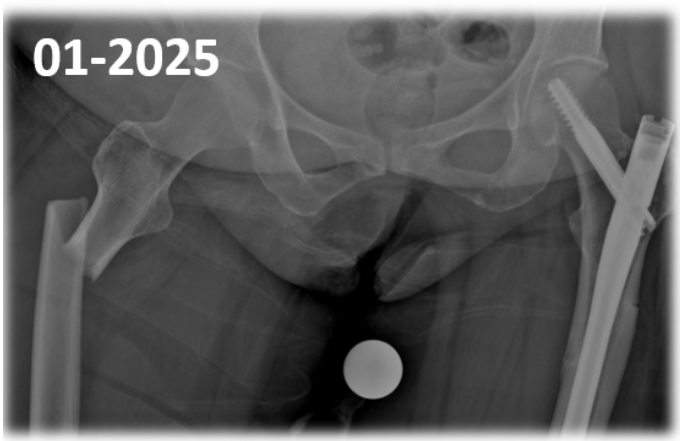
A 70-year-old woman with a medical history of asthma, chronic obstructive pulmonary disease , and type 2 diabetes mellitus was diagnosed with osteoporosis 2008 and started on Alendronic acid. Her regular medications included long-term steroids, which likely contributed to increased bone fragility.
She sustained an atypical femoral fracture (AFF) of the left femur April 2024 following a minor fall, which was managed surgically with an interlocking nail. Following this, Alendronic acid was discontinued and denosumab was initiated based on recommendations from a rheumatology multidisciplinary team However, the transition from Alendronic acid to denosumab was not accompanied by close follow-up, which emerged as a critical learning point.
January 2025, the patient presented with an atypical fragility fracture of the contralateral femur, emphasizing the bilateral risk of AFF. The literature indicates that approximately 30% of AFF cases progress to bilateral fractures within one year, particularly in patients with prolonged bisphosphonate use or concurrent glucocorticoid therapy. Unfortunately, there are no clear guidelines for managing contralateral unfractured femurs in AFF. Current management is guided by clinical judgment and varies widely, with options ranging from close monitoring to prophylactic surgical fixation, often depending on surgeon preference.
This case underscores the importance of individualized, multidisciplinary care and highlights critical gaps in evidence-based management strategies for AFF. Specifically, it emphasizes the need for rigorous follow-up during treatment transitions and calls for further research to guide decision-making regarding prophylactic fixation of contralateral femurs in high-risk patients.





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UTILIZING CALCIUM ISOTOPE MARKER (CIM) TECHNOLOGY FOR MONITORING DENOSUMAB TREATMENT IN OSTEOPOROSIS

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Denosumab, a monoclonal antibody targeting RANKL, is a well-established therapy for osteoporosis. Monitoring its effectiveness is essential due to potential side effects, including hypocalcemia, osteonecrosis of the jaw, and atypical femoral fractures. Current patient management involves regular assessments of bone mineral density (BMD) through dual-energy X-ray absorptiometry (DXA) scans. While DXA and bone turnover markers (BTMs) like CTX and P1NP track changes in BMD and overall turnover, they have limited sensitivity to nuanced, time-resolved alterations in bone metabolism. In contrast, Calcium (Ca) Isotope Markers (CIM), which measure naturally occurring variations in stable Ca isotope ratios, e.g. 44Ca/42Ca, in serum (CIM_serum) and urine (CIM_urine), offer a potentially more sensitive and individualized approach for monitoring bone health and therapy responsiveness. In this pilot study, 13 postmenopausal women with DXA-confirmed osteoporosis (T-score range: -2.5 to -3.7) were initiated on standard denosumab therapy. Over a 24-week period, serial measurements of CIM_serum and CIM_urine were obtained at the day of initiation of the denosumab therapy and then at week 1, 2, 4, 8, 12 16, 20 and 24 after therapy initiation alongside traditional indicators including DXA-derived BMD, CTX, P1NP and PTH. CIM thresholds that distinguish net bone Ca uptake from net resorption were applied to evaluate how patients responded over time at an individual level. Baseline CIM values at the start of denosumab therapy (average CIM_serum: -1.09±0.15 ‰ and CIM_urine: 0.00±0.22 ‰) were all below the CIM threshold value of -0.85 ‰ indicating net bone calcium loss before and at the initiation of the denosumab therapy, consistent with advanced DXA determined osteoporosis. Following denosumab administration, all patients showed a significant average increase by +0.4 ‰ in CIM_serum and CIM_urine values after one week. Highest CIM_serum and CIM_urine values were reached in week 4 to 8 (CIM_serum: ~-0.7 ‰) after the start. While an overall improvement was observed among the 13 patients due to denosumab therapy, individual CIM values presented a more nuanced picture. Five patients exhibited rapid increases in their CIM_serum and -_urine values above threshold levels, signalling robust antiresorptive responses and new bone formation. Eight patients showed improvements and bone mineralization, with three demonstrating improved CIM values still below the threshold. Five patients exhibited more modest or transient changes in CIM values. PTH and CIM_serum as well as CIM_urine values were significantly positive correlated (serum: r=+0.65, p<0.001; urine: r=+0.39, p<0.01) emphasizing the interaction of denosumab therapy with renal functionality for bone Ca mineralisation. Overall, our observations suggest that the baseline severity of osteoporosis, as indicated by initial CIM values in serum and urine, influences each patient's response to a standardized denosumab regimen. In contrast, DXA and BTMs provided less granular insights, primarily confirming average group-level gains without elucidating individual variability. CIM provides non-invasive, time-resolved, patient-specific data on bone metabolism changes and may enable early, individualized adjustments of therapy beyond what is possible with DXA and conventional BTMs. Although further validation in larger, controlled cohorts is warranted, these findings highlight CIM's potential to enhance osteoporosis management through personalized treatment monitoring.

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CALCIUM ISOTOPE RATIOS IN SERUM INFORM ON SKELETAL CALCIUM BALANCE IN PATIENTS ON DIALYSIS

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Dysregulated mineral homeostasis in chronic kidney disease (CKD) can cause bone demineralization and an increased risk of fractures. In both healthy individuals and patients with advanced kidney failure, the ratio of naturally occurring non-radioactive calcium (Ca) isotopes 44Ca/42Ca in serum (Calcium isotope marker: CIM_Serum), serves as quantitative indicator of bone Ca balance (BCaB). Preferential incorporation of the lighter 42Ca isotope into bone elevates CIM_Serum during periods of net bone formation and reduces it when bone resorption predominates. In this study we measured the Ca isotope composition in bone biopsies (CIM_Bone) to determine the sensitivity of CIM_Serum in estimating BCaB. Nineteen patients receiving chronic dialysis (median age 60 years, time on dialysis 3.3 years) underwent Dual Energy X-ray Absorptiometry (DXA) and bone biopsies at the time of kidney transplantation. CIM_Serum and CIM_Bone was measured simultaneously in serum and bone biopsies. After adjustment of all study participants for the uptake of Ca supplements

and renal impairment, we compared the results to those with a control group of ten adults with osteoporosis only. Results show that both CIM_Serum and CIM_Bone were significantly lower in the dialysis patients cohort than in the osteoporosic control. In the osteoporosis group, CIM_Serum correlated strongly with CIM_Bone (p=0.0018, R^2=0.72). A positive, albeit weaker, correlation was also observed in the dialysis group (p=0.005, R^2=0.37). CIM_Serum and CIM_Bone correlated positively with osteoblastic markers BAP and PINP, and inversely with PTH. While only 31% had DXA T-scores below -2.5 defining osteoporosis, CIM_Serum indicated severe bone mineral depletion in 89% of subjects. Histologic analysis revealed that CIM_Bone correlated positively with trabecular thickness and mineralized area, and inversely with osteoid area. Multiple regression analysis identified CIM_Bone (β=0.88, 95% CI -1.31 to -0.29, p<0.001), BALP (β=0.63, 95% CI 0.19 to 0.41, p=0.008), and osteoid area (β=-0.31, 95% CI -1.24 to -0.16, p=0.03) as significant predictors of CIM_Serum, collectively accounting for 87% of its variability. In conclusion, CIM_Serum is a significant and independent predictor of BCaB in dialysis patients, correlating strongly with CIM_Bone provides a comprehensive, real-time assessment of bone health, potentially enhancing the clinical evaluation of CKD-associated bone disease.

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A CORRELATION-BASED APPROACH TO PREDICTING DXA USING THE CALCIUM ISOTOPE MARKER (CIM)

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Early detection of osteoporosis onset enhances prospects of success for prophylactic actions in bone fracture prevention. Commonly Dual-energy X-ray absorptiometry (DXA) is applied to quantify bone mineral density (BMD) at a single point in time but does not capture the dynamic rate at which calcium (Ca) is being gained or lost from the skeleton. In contrast, changes in the Ca isotope ratio (44Ca/42Ca), referred to as the Ca isotope marker (CIM) and measured in blood (CIM_serum) or urine (CIM_urine), has been shown to detect alterations in the balance between bone Ca absorption and resorption in near real-time. To evaluate the diagnostic potential of the CIM method in osteoporosis, we retrospectively analyzed data from four clinical studies involving 293 post-menopausal women aged 25 to 81 years, none of whom had kidney failure or vitamin D deficiency (< 25 nmol/L). We compared their CIM_serum and CIM_urine values with the corresponding minimum DXA T-scores of either hip or lumbar spine. The results revealed significant correlations among CIM_serum, CIM_urine, and DXA values, indicating that changes in Ca isotope ratios are closely related to alterations in BMD (CIM_serum/DXA: r^2 = 0.68, p < 0.001; CIM_serum/CIM_urine: r^2 = 0.54, p < 0.001; CIM_urine/DXA: r^2 = 0.43, p < 0.001). Threshold values were defined at −0.85±0.06 ‰ for CIM_serum and 0.23±0.06 ‰ for CIM_urine. Values above or below the confidence interval of these thresholds indicate either bone Ca gain or loss, respectively, in particular the latter pointing toward an increased risk of osteoporosis. Grouped mean DXA values for T-score intervals (Δ=1) ranging from -4 to 3 could be approximated either by second-order polynomials using CIM_serum or CIM_urine (DXA T-score ≈ -10.66·(CIM_serum)² − 0.599·CIM_serum + 6.67, R^2 = 0.35; DXA T-score ≈ -9.95·(CIM_urine)² + 20.18·CIM_urine − 5.21, R^2 = 0.93) or by a multiple linear regression combining both markers (DXA T-score ≈ 6.72·CIM_serum + 13.13·CIM_urine + 1.49, R^2 ≈ 0.98). CIM-derived DXA thresholds correspond to a DXA T-score of approximately -1.2, which is considerably higher than the current osteoporosis diagnostic threshold of -2.5. Post study assessment of osteoporosis related fractures two years after the OsteoGeo study (Eisenhauer et al. 2019, 2024) revealed that all low-trauma fractures were characterized by CIM_serum values below the threshold whereas only one third of the low-trauma fractures occurred in the range at or below the DXA T-score range usually associated with osteoporosis. In conclusion, our results show that CIM values can generally be positively correlated with the corresponding DXA T-score values. The application of the non-invasive CIM procedure therefore represents a significant improvement for early risk detection and therapy monitoring for patients with metabolic diseases of the musculoskeletal system and in particular for osteoporosis.

P149

MAKE A HABIT OF TWO THINGS: TO HELP; OR AT LEAST TO DO NO HARM. GERIATRIC POLYPHARMACY AND HIP FRACTURES

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Introduction: Falls are a major cause of fractures among older adults, with polypharmacy recognized as a key contributing factor. Furthermore, potentially inappropriate medications (PIMs) and inappropriate polypharmacy have been identified as increasing the risk of falls. This study aimed to evaluate the medications prescribed to older surgical patients with hip fractures to assess the prevalence of polypharmacy and identify PIMs. A secondary objective was to analyze the specific characteristics of medications prescribed to older patients with hip fractures.
Materials and Methods: This retrospective study reviewed clinical data from patients aged 70 years and older who underwent hip surgery at our hospital between November 2022 and November 2024. A log-linear model was applied to investigate the relationship between the number of prescribed medications and the

prevalence of hip fractures.
Results: A total of 200 patient records were analyzed. Of these, 71% of older adults with hip fractures were prescribed five or more medications. The most commonly prescribed categories of PIMs were antihypertensives, anticoagulants, diuretics, and non-steroidal anti-inflammatory drugs. Multivariable analysis demonstrated a significant association between polypharmacy and the occurrence of hip fractures. Notably, anticoagulants and diuretics showed a strong correlation with the prevalence of hip fractures. When considering anticoagulants, compared with warfarin, NOACs (new oral anticoagulants) were associated with lower risks of bone fracture. A positive relationship was also observed between the prevalence of hip fractures and the number of PIM categories prescribed to older patients with hip fractures.
Conclusions: This study highlights the patterns of medication use in older surgical patients with hip fractures. Older adults with hip fractures require special attention, particularly those prescribed multiple medications or several categories of PIMs, especially anticoagulants and diuretics. Identifying and preventing adverse drug reactions (ADRs) in older patients necessitates consistent monitoring and regular evaluation of both prescribed and over-the-counter medications.
ADRs are common contributors to cognitive or functional decline, falls, gastrointestinal bleeding, heart failure, and orthostatic hypotension. Geriatracian should routinely consider the possibility of ADRs in their differential diagnoses and ensure that new medications are prescribed with clear therapeutic objectives. Medications deemed ineffective or unnecessary should be deprescribed. Although standardized tools such as appropriateness criteria and risk prediction models are valuable, they should be viewed as adjuncts to, rather than substitutes for, clinical judgment informed by comprehensive training in geriatric pharmacotherapy.

P150

EFFECT OF HEALTH LITERACY ON ADHRENCE TO OSTEOPOROSIS TREATMENT

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Background: Effective management of osteoporosis requires a holistic approach including pharmacological treatments and lifestyle modifications. Despite the availability of effective therapies, adherence to osteoporosis treatment remains a critical challenge. Many factors can influence treatment adherence, with health literacy identified as one of the key determinants.
Objective : The aim of this study was to assess the effect of health literacy on adhrence to osteoporosis treatment.
Methods: We conducted a cross-sectional study involving patients diagnosed with osteoporosis, recruited from the rheumatology department of Monji Slim Hospital. Sociodemographic data as well as disease-related characteristics were transcribed (medical history, educational level, occupation, marital status, living setting).
Health literacy was assessed using the The European Health Literacy Survey Questionnaire (HLS-EU-Q), a validated tool that measures general health literacy across four key domains: understanding of health information, communication with healthcare providers, decision-making in health, and the ability to navigate the healthcare system. The HLS-EU-Q is scored from 0 to 16. Health literacy levels were classified as inadequate (<8), problematic (9–12), and sufficient (13–16).
Adherence to osteoporosis treatment was evaluated through the Morisky Medication Adherence Scale (MMAS-8): a self-assessment tool designed to evaluate medication adherence behavior that consists of eight questions with a yes or no response format. A significance threshold was set at $p<0.05$.
Results: The study included 28 patients undergoing osteoporosis treatment, with a female predominance (sex ratio M/F =0.08). The mean age was 64± 9 years[45-82]years old and the mean weight was 58± 16 kg[22-88] .
Regarding educational levels, 4% had a university level or higher, 42% had a secondary level, 27% had a primary level, and 27% were illiterate. In terms of occupation, 4% were employed, 73% were unemployed, and 23% were retired. As for marital status, 60% were maried, 4% were single, 28% were widowed, and 8% were divorced.
Seventy-three percent of patients lived in urban areas, while 27% resided in rural settings.
Additionally, 88% of participants reported having a rheumatic disease, and 9% had a history of neoplasia. Fracture-related complications were observed in 17% of patients.
Among the surveyed patients, 31% demonstrated inadequate health literacy, 65% had problematic health literacy, and only 4% had sufficient health literacy.
The mean MMAS-8 score was 4.5± 3 [0-8]. Among the participants, 5% reported high adherence to their treatment, 33% demonstrated medium adherence, and 62% showed low adherence.
Significant associations were observed between adherence and health literacy ($p = 0.047$), weight ($p = 0.034$), and fractures ($p = 0.006$).
Health literacy was significantly associated with educational level ($p=0.023$) and the presence of neoplasia($p=0.04$).
Conclusion:
Healthcare providers should prioritize comprehensive discussions with patients, focusing on enhancing health literacy related to osteoporosis. This approach is essential for improving patient adherence, optimizing treatment outcomes, and ultimately reducing fracture risk.

P151

IMPACT OF PATIENT GLOBAL ASSESSMENT PHRASING ON THE RHEUMATOID ARTHRITIS REMISSION RATES

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Background :
Patient global assessment (PGA) is included in almost all rheumatoid arthritis (RA) composite activity scores and definitions of remission. However, the absence of a standardized PGA formulation may influence disease activity assessments. This study examines how different PGA formulations affect the evaluation of remission in RA.
Methods :
We conducted a cross-sectional observational study on patients with RA (2010 ACR/EULAR criteria). The PGA was measured using five formulations (PGA V1: ACR-EULAR version, PGA V2: CDAI/SDAI version, PGA V3: original DAS version, PGA V4: current DAS version, PGA V5: investigator-formulated version). Composite scores (DAS28 ESR, DAS28 CRP, SDAI, CDAI) were calculated for each patient using each PGA formulation, with PGA V1 serving as the reference.
Results :
Seventy-four patients, 61 women and 13 men, with a median age of 61 years [56.7-67.2], were included. The mean PGA scores varied across formulations, ranging from 41.2 ± 24.9 (PGA V2) to 54.3 ± 28.9 (PGA V4). Correspondingly, composite scores fluctuated. The DAS28 ESR ranged from 4.21 ± 1.37 (PGA V2) to 4.37 ± 1.39 (PGA V4).
The DAS28 CRP ranged from 3.38 [2.49–4.31] (PGA V2) to 3.69 ± 1.51 (PGA V5). The SDAI ranged from 11.7 [7.46–23.6] (PGA V3) to 18.58 [12.27–32.35] (PGA V1). The CDAI ranged from 10.5 [5.87–18] (PGA V2) to 13 [7–17.25] (PGA V3).
The maximum differences in remission rates, depending on the PGA formulation used within the same index (highest minus lowest), were as follows: 5% (CDAI), 5% (DAS28 ESR), 7% (SDAI) and 9% (DAS28 CRP).
Statistically significant differences in remission rates were observed: Between DAS28 ESR V3 and DAS28 ESR V1 (p = 0.035), between CDAI V2 and CDAI V1 (p = 0.045), and between CDAI V3 and CDAI V1 (p = 0.044).
No significant differences were found for DAS28 CRP and SDAI across the various PGA formulations compared to V1.
Conclusion :
Our study indicates that using different PGA formulations can impact the assessment of remission status in RA patients, potentially influencing clinical management decisions. Therefore, standardizing the PGA formulation in clinical practice is essential to ensure consistent and accurate evaluations of disease activity.

P152

VARIABILITY IN PATIENT GLOBAL ASSESSMENT SCORING: IMPACT OF DIFFERENT FORMULATIONS IN RHEUMATOID ARTHRITIS

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Background :
The Patient Global Assessment (PGA) is a common item in all rheumatoid arthritis (RA) activity scores, but no reference formulation exists. The objective of our study was to analyze the impact of different PGA formulations on how patients rated this scale.
Methods :
We conducted a cross-sectional observational study on patients with RA (2010 ACR/EULAR criteria). Sociodemographic, clinical, biological, and radiographic data were collected. The PGA was measured using five formulations (PGA V1: ACR-EULAR version, PGA V2: CDAI/SDAI version, PGA V3: original DAS version, PGA V4: current DAS version, PGA V5: investigator-formulated version). The differences among the five PGA formulations were evaluated using the following methods: Pearson's correlation coefficients, Bland-Altman plots, paired sample t-tests to compare the mean scores for each formulation, and an analysis of the proportion of patients who scored ≤ 100 mm on each formulation. The first version of PGA was used as the reference.
Results :
Seventy-four patients, 61 women and 13 men, with a median age of 61 years [56.7-67.2], were included. The mean PGA ranged from 41.2±24.9 (PGA V2) to 54.3±28.9 (PGA V4). The formulations showed significative positive correlations (r ranging from 0.436 to 0.743). Bland Altman plots showed low agreement between formulations, with 95% limits of variability ranging from [−45.1 to +44.8 mm] (PGA V3 versus V1) to [−49.2 to +50.8 mm] (PGA V5 versus V1).
The comparison of means across the different PGA formulations revealed that the PGA V2 formulation (CDAI/SDAI version) had the lowest mean (41.8 ± 24.9), with a statistically significant difference (p = 0.000) compared to the reference (PGA V1: ACR-EULAR version).
The comparison of the proportions of patients with PGA values ≤ 100 mm showed a statistically significant difference between PGA V1 and the other versions: PGA V2 versus PGA V1 (p = 0.003), PGA V3 versus PGA V1 (p = 0.006), PGA V4 versus PGA V1 (p = 0.001), and PGA V5 versus PGA V1 (p = 0.006).
Conclusion :
Our study demonstrated that the use of different formulations of the PGA influenced its scoring. A standardized version of the PGA would ensure better patient management.

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VARIABILITY IN PATIENT GLOBAL ASSESSMENT FORMULATIONS: INSIGHTS FROM TUNISIAN RHEUMATOLOGISTS

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Introduction: Rheumatoid arthritis (RA) is the most common chronic inflammatory rheumatism affecting young adults. Accurate assessment of disease activity is crucial for optimizing patient management. The Disease Activity Score 28 (DAS28) is a validated and widely used composite tool for measuring RA activity. One of its components, the Patient Global Assessment (PGA), which lacks standardized formulations.
This study aimed to evaluate the different PGA formulations used by Tunisian rheumatologists for DAS28 calculation.
Methods: A cross-sectional descriptive study was conducted among Tunisian rheumatologists. A self-administered online questionnaire was created and distributed via Google Forms. Participants were asked which PGA formulation they used among five options: PGA1: "Considering all the ways your arthritis has affected you, how do you rate your arthritis today?" (ACR/EULAR version). PGA2: "Considering all the ways your arthritis affects you, how do you evaluate your overall health?" (CDAI/SDAI version). PGA3: "How would you rate your health over the past week?" (Original DAS28 version). PGA4: "How active has your arthritis been over the past week?" (Current DAS28 version). PGA5: "Your disease has highs and lows. When it is very active, there is more pain, morning stiffness, joint swelling, and fatigue. Considering these elements, how would you rate the state of your disease over the past week?" (Investigator-formulated version).
Results: The study population had a mean age of 31.6 years [25–48], with a mean duration of practice of 6.2 years [1–20]. The professional activity was university hospital-based in 73.3% of cases, public hospital-based in 16.7%, and private in 10%. The distribution of PGA formulations used was as follows: PGA4: 43.8%, PGA3: 18.8%, PGA1: 15.6%, PGA5: 15.6% and PGA2: 6.3%. Younger rheumatologists were more likely to use PGA4 (p=0.02). Rheumatologists with less than 5 years of practice predominantly used PGA4 (p=0.01), while those with more than 10 years of practice preferred PGA1 and PGA3 (p=0.03). Hospital-university practitioners favored PGA4 (p=0.008), while private sector rheumatologists predominantly used PGA3 and PGA5 (p=0.04).
Conclusion: This study highlights significant variability in PGA formulations used by Tunisian rheumatologists for DAS28 calculation. These differences may impact the evaluation of disease activity and underscore the need for standardizing PGA formulations to ensure consistent DAS28 assessments. Further research is warranted to explore how these variations influence clinical outcomes and treatment decisions.

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SATISFACTION WITH THE DIAGNOSTIC ANNOUNCEMENT AMONG TUNISIAN PATIENTS WITH RHEUMATOID ARTHRITIS

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Introduction : The announcement of a chronic disease diagnosis is a pivotal moment in establishing a strong doctor-patient relationship. Rheumatoid arthritis (RA) is a chronic and potentially disabling condition. A well-structured diagnostic announcement process can facilitate patient understanding and acceptance of the disease. This study aimed to evaluate patients' perceptions of the diagnostic announcement process in RA and to assess the factors associated with the diagnostic satisfaction.
Methods: This was a cross-sectional study involving patients diagnosed with RA according to the 2010 ACR/EULAR criteria. The quality of the diagnostic announcement was assessed using a 5-point Likert scale (1 to 5, defined as: 1: Not at all satisfied; 2: Slightly satisfied; 3: Satisfied; 4: Moderately satisfied; 5: Very satisfied). Statistical analysis was conducted with a significance threshold set at $p<0.05$.
Results: A total of 100 patients were included, 25 men and 75 women, with a mean age of 58 years [31-80]. The mean disease duration was 36.3 months [3-84]. RA was seropositive in 88.2% of cases and erosive in 49%.
Regarding announcement circumstances, 71% of patients were satisfied with the reception, 20% were moderately satisfied, and 9% were very satisfied. The waiting time was deemed satisfactory by 68% and moderately satisfactory by 20%. The diagnosis was announced in the physician's office in 81% of cases and 69% of patients were alone with the physician.
Concerning physician-related characteristics, 91% of patients reported that the physician introduced themselves at the beginning of the consultation. All patients perceived their physicians as confident, 92% found them empathetic and 89% judged them reassuring. Additionally, 96% of patients considered the time allocated for the announcement sufficient. Regarding communication clarity, 6% found the physician's explanation incomprehensible. In 94% of cases, the diagnosis was precisely stated by naming the disease. The majority of patients (96%) perceived the announcement process as gradual. About 21% of patients reported that their physicians asked if they had questions about the disease.
Satisfaction with the diagnostic announcement was significantly associated with the announcement ($p = 0.012$). A strong positive correlation was observed between satisfaction with the diagnostic announcement and satisfaction with the explanations provided about the disease ($p = 0.000$) as well as the level of understanding of the disease ($p = 0.006$). Additionally, satisfaction with the diagnostic announcement was significantly linked to the accuracy of the diagnostic statement ($p = 0.000$), the naming of the disease ($p = 0.000$), the manner of announcement ($p = 0.000$), the stage of announcement ($p = 0.024$), and the physician's empathetic ($p = 0.000$) and reassuring attitudes ($p = 0.000$).

Conclusion: Our study highlights that precise and well-structured communication, combined with an empathetic and reassuring physician attitude, enhances the patient experience during the diagnostic announcement of RA. These aspects should be considered to optimize medical communication and improve patient outcomes.

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KNOWLEDGE OF TUNISIAN RHEUMATOLOGISTS REGARDING TRAVEL FOR PATIENTS WITH CHRONIC INFLAMMATORY RHEUMATIC DISEASES ON IMMUNOSUPPRESSANTS

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Introduction: The increasing number of patients with chronic inflammatory rheumatic diseases (CIRD) traveling internationally coincides with the rise in immunosuppressive (IS) treatments. These patients face a heightened risk of infections, making it essential to provide appropriate travel-related advice. This study aimed to assess the knowledge of Tunisian rheumatologists concerning preventive measures and educational points for CIRD patients on IS therapy planning to travel.

Methods: A cross-sectional descriptive study was conducted among Tunisian rheumatologists who are members of a social media group established under the Tunisian Anti-Rheumatic League. A self-administered questionnaire was created and distributed via Google Forms over a four-month period.

Results: Out of 186 contacted rheumatologists, 56 responded (30%). The average age was 48.4 ± 10.5 years, predominantly female (sex ratio = 0.27), with an average of 19 ± 10 years of experience. Fourty-three rheumatologists (77%) consulted at least six CIRD patients on IS therapy per week.

Thirty-four rheumatologists (60.7%) reported being occasionally asked by patients for pre-travel advice. Ten physicians (18%) were aware of specialized travel consultations, yet 34 (60.7%) had never referred patients to such services.

Topics addressed by at least 62.5% of rheumatologists included travel characteristics, exposure risks to certain diseases, travel-related issues concerning CIRD and vaccination. Live attenuated vaccines were considered contraindicated by at least 45% of respondents.

Regarding treatments, 35 rheumatologists (62.5%) did not discontinue IS therapy before administering inactivated vaccines. For live attenuated vaccines, 40 (71%) recommended stopping IS therapy one to six months prior to vaccination, with 32 (57%) advising resumption two weeks post-vaccination. Twenty-three rheumatologists (41%) provided advice on medication storage during travel.

Concerning IS infusions, 50 rheumatologists (89%) agreed to administer them in the destination country if the travel was extended and hygiene conditions were met.

Twelve rheumatologists (21%) offered suggestions to enhance patient management, with six proposing easily accessible guides for patients and five recommending training sessions for rheumatologists on this topic.

Conclusion: A specialized pre-travel consultation is highly recommended for CIRD patients on IS therapy to discuss infectious disease prevention and general precautions. It is crucial for physicians to stay updated with the latest recommendations to provide optimal care.

P156

ANEURYSMAL BONE CYST OF THE CALCANEUS: AN EXCEPTIONAL LOCALISATION

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Objective: Aneurysmal bone cysts are lesions with an unclear origin and pathogenesis. They are commonly found in pediatric populations. Their occurrence in the calcaneus is quite unusual.

Case Report: A 20-year-old male, with no significant medical history, presented with a foot injury. A radiograph revealed a large, cystic lesion in the calcaneus consistent with Lodwick's type IA. Subsequent CT and MRI scans confirmed the presence of multiple intraosseous cavities with a fluid-fluid level and a hypo-intense margin, strongly suggesting an aneurysmal bone cyst.

The patient underwent surgical excision of the cyst followed by bone grafting using autologous iliac crest bone. Histopathological examination confirmed the diagnosis of an aneurysmal bone cyst.

At the 9-month follow-up, the patient was pain-free and radiographic imaging showed complete healing with no evidence of recurrence.

Discussion: Aneurysmal bone cysts of the calcaneus can be discovered incidentally during imaging studies for unrelated reasons. Patients may present with ankle pain, swelling, or a pathological fracture.

The primary differential diagnosis for aneurysmal bone cysts, especially in the calcaneus, is telangiectatic osteosarcoma. Given their similar imaging characteristics, a high index of suspicion is necessary to differentiate between these two entities.

Advanced imaging techniques such as MRI can be invaluable in characterizing the lesion and aiding in the differential diagnosis.

A watchful waiting approach can be considered for small, asymptomatic lesions, especially in young patients.

Surgical excision with curettage and bone grafting is the gold standard treatment.

In certain cases, adjuvant therapies such as embolization may be considered prior to surgery to reduce blood flow to the lesion.

Despite surgical treatment, there is a significant risk of recurrence, estimated to be around 30%. Regular follow-up imaging is essential to monitor for any signs of recurrence.

Conclusion: While most aneurysmal bone cysts are benign, their aggressive local growth potential and the risk of recurrence high-

light the importance of early diagnosis and appropriate management.
Definitive diagnosis is based on histopathological examination of the surgical specimen.
Treatment decisions should be individualized based on the patient's age, symptoms, functional demands, and the specific characteristics of the lesion.

P157

BILATERAL AND SIMULTANEOUS SCAPHOID FRACTURES: A SURGICAL CASE REPORT

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Objective:
Scaphoid fractures are the most common carpal bone fractures, but bilateral, simultaneous fractures are rare.
Case Report:
A 24-year-old right-handed male presented with acute pain in both wrists following a fall. Physical examination revealed tenderness over the anatomical snuffboxes on both sides. Radiographs confirmed bilateral Herbert type B2 scaphoid fractures. The patient underwent bilateral percutaneous screw fixation. At the final follow-up, both fractures had healed, and the patient had regained full wrist motion.
Discussion:
Scaphoid fractures account for 70-80% of carpal bone fractures. Due to subtle initial symptoms, these fractures are often diagnosed late despite advances in imaging. The primary mechanism of injury is a fall onto an outstretched hand. Scaphoid fractures are most common in young, active males who may be reluctant to undergo prolonged immobilization, especially for bilateral fractures.
While recent trends favor internal fixation for bilateral scaphoid fractures to avoid prolonged casting and lost work time, conservative treatment with casting can also yield successful outcomes.
For displaced fractures, open reduction and internal fixation is typically indicated, with the specific technique depending on the fracture pattern and surgeon preference.
It is essential to assess for associated cartilage damage, as this can negatively affect the final outcome. Bilateral scaphoid fractures treated with screw fixation typically heal well with no limitations in wrist motion.
Conclusion:
Bilateral, simultaneous scaphoid fractures are uncommon but require appropriate treatment to ensure healing and a quick return to normal activities.

P158

CHONDROMA OF THE SCAPHOID BONE: A RARE CASE REPORT

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Objective:
Chondromas are benign bone tumors that develop from cartilage-forming cells. They can be solitary or multiple. While chondromas commonly affect the hands, their occurrence in the carpal bones, especially the scaphoid, is relatively rare.
Case Report:
A 19-year-old patient presented with a 6-month history of wrist pain following a minor trauma. Physical examination revealed tenderness over the scaphoid tubercle. Radiographs showed a cortical fracture of the scaphoid within a well-defined, oval-shaped lucency measuring 8 mm in diameter. CT scan further confirmed the presence of an osteolytic lesion with a sclerotic rim. Based on these findings, a diagnosis of a chondroma complicated by a fracture was strongly suspected.
The patient underwent surgery involving removal of the tumor and bone grafting. Post-operatively, the patient was immobilized in a cast for three months. Histopathological examination confirmed the diagnosis of a chondroma.
At the one-year follow-up, the patient was pain-free with full wrist motion, and radiographs showed complete healing.
Discussion:
Chondromas of the scaphoid can be discovered incidentally, often during imaging for unrelated reasons, such as a wrist fracture. Patients may present with a painless mass, localized pain, or vague wrist discomfort.
Chondromas typically appear as radiolucent areas with a sclerotic rim. The overlying cortex is often thinned but intact, except in cases of fracture.
These lesions often have a more aggressive appearance with a "soap-bubble" pattern on imaging.
The histological appearance of chondromas is characteristic, showing a lobular pattern of hyaline cartilage.
The traditional approach involves curetting the lesion and filling the defect with bone graft. In cases of larger or more aggressive lesions, en bloc resection may be necessary.
Autologous bone grafts, such as iliac crest or distal radius, are commonly used to fill the defect and promote healing. Immobilization and early range-of-motion exercises are typically recommended to prevent stiffness.
Conclusion:
With appropriate surgical treatment, the prognosis for chondromas of the scaphoid is excellent, with a low risk of recurrence.

P159

DEGENERATIVE MENISCAL LESIONS: A RETROSPECTIVE STUDY OF 20 CASES

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Objective:
The concept of degenerative meniscal lesions (DMLs) has evolved significantly since its introduction in 1970. While initially controversial, DMLs are now recognized as a significant clinical entity. This retrospective study aimed to investigate the clinical presentation, surgical management, and short-term outcomes of patients with DMLs.
Material and Methods:
Twenty patients diagnosed with DMLs based on MRI findings were included in the study. All patients underwent arthroscopic knee surgery following the failure of conservative treatment. Intraoperative findings were classified according to the French Arthroscopy Society, and any concomitant cartilage lesions were classified using the Béguin and Locker system.
Results:
The study population comprised predominantly males with a mean age of 51 years. The primary presenting symptom was knee pain without a history of significant trauma. Arthroscopic evaluation confirmed the degenerative nature of the meniscal lesions, with partial meniscectomy performed in two-thirds of cases. At a mean follow-up of 2 years, 15 patients reported improved pain and knee function.
DMLs represent a spectrum of degenerative changes within the meniscus, leading to structural alterations and functional impairment. While MRI plays a crucial role in diagnosis, clinical examination remains essential. Conservative management, including physical therapy and non-steroidal anti-inflammatory drugs, should be the initial treatment approach. Surgical intervention, primarily partial meniscectomy, may be considered in patients with persistent symptoms refractory to conservative care.
However, the long-term impact of meniscectomy on DMLs remains a subject of ongoing debate. Concerns exist regarding its potential to accelerate cartilage degeneration and contribute to the development of osteoarthritis.
Conclusion:
This study highlights the challenges in managing patients with DMLs. While surgery can provide short-term pain relief, its long-term effects and the potential for iatrogenic cartilage damage warrant careful consideration. A multidisciplinary approach, emphasizing conservative management and judicious surgical intervention, is crucial for optimizing patient outcomes.

P160

EVALUATING THE PSYCHOLOGICAL IMPACT OF TOTAL HIP REPLACE: A COHORT STUDY OF 100 PATIENTS

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Objective:
Pre-operative screening for psychiatric disorders before total hip arthroplasty and subsequent treatment can lead to improved patient-reported outcomes in individuals undergoing surgery for degenerative coxarthrosis, while potentially reducing healthcare costs.
Our objective is to assess the psychological impact of total hip replacement on patients with degenerative coxarthrosis.
Material and Methods:
This retrospective cross-sectional study included patients who underwent total hip arthroplasty for degenerative coxarthrosis over a four-year period. Data were collected using the Hospital Anxiety and Depression Scale, a 14-item self-report scale assessing anxiety and depression symptoms. A total score of 11 or more indicates clinically significant symptoms.
Results:
A total of 100 patients, predominantly male with an average age of 49, were included in this study. The most common patient complaints were pain (94.9%), limping (49.4%), and reduced walking distance (35.9%, with an average of 200 meters).
Post-operatively, all patients were encouraged to sit up on the first day and 74.4% were able to walk. Rehabilitation was provided to 94.9% of patients for an average of 25 days.
At the one-year follow-up, 79.5% of patients could walk without assistance, while 14.1% needed one cane and 3.8% required two canes.
A statistically significant improvement in the Hospital Anxiety and Depression Scale was observed. Preoperatively, the average depression score was 6.86 ± 2.86, which decreased to 3.85 ± 2.21 postoperatively. This translated to a decrease in the proportion of patients experiencing "certain depression" from 12.8% to 9%.
Similarly, the average anxiety score declined from 8.44 ± 3.06 preoperatively to 4.86 ± 2.66 postoperatively, with the percentage of patients with "certain anxiety" significantly reduced from 28.2% to 5.1%.
Conclusion:
This study demonstrated a significant reduction in anxiety and depression levels following total hip replacement surgery for patients with degenerative coxarthrosis. Pre-operative screening and appropriate treatment for mental health conditions may be a valuable component of comprehensive care for these individuals. The observed improvements in mental well-being can be attributed to various factors, including pain relief, increased functional capacity, and enhanced quality of life.

P161

EVALUATION OF SLEEP QUALITY IN PATIENTS UNDERGOING TOTAL HIP ARTHROPLASTY FOR DEGENERATIVE COXARTHROSIS

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Objective:
Chronic hip pain in patients with degenerative coxarthrosis can significantly affect sleep quality. Our objective is to evaluate sleep quality in patients undergoing total hip arthroplasty for degenerative coxarthrosis using the Pittsburgh Sleep Quality Index (PSQI).

Material and Methods:
This retrospective, descriptive, and analytical cross-sectional study included 100 patients who underwent total hip arthroplasty for degenerative coxarthrosis within a four-year period. Data were collected using the PSQI, a self-reported questionnaire comprising 19 items that generate seven component scores: subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction.

Results:
The mean age of the participants was 49 years, with a male predominance. Preoperatively, the most common functional complaints were pain (94.9%), limping (49.4%), and reduced walking distance (35.9%). The average walking distance was 200 meters. Hip joint involvement was primary in 52.6% of cases and secondary to systemic disease in 47.4%. Coxarthrosis was the primary indication for total hip arthroplasty in 52.6% of cases, followed by osteonecrosis of the femoral head in 21.7%, and dysplasia in 8.9%.

Postoperatively, sleep quality significantly improved, with a substantial decrease in the mean total PSQI score from 7.72 preoperatively to 3.01 postoperatively. The proportion of patients considered "good sleepers" (with a PSQI score ≤ 5) increased significantly from 24.4% to 87.2%.

Our analysis revealed a statistically significant correlation between post-total hip arthroplasty sleep quality, as measured by the Pittsburgh Sleep Quality Index (PSQI), and the patient's preoperative walking distance and subjective range of motion.

This suggests that patients with greater functional limitations before surgery tend to experience more significant improvements in sleep quality following total hip arthroplasty.

Conclusion:
The results of this study support the hypothesis that total hip arthroplasty can effectively alleviate the sleep disturbances commonly associated with degenerative coxarthrosis. To optimize patient outcomes, it is crucial for healthcare providers to discuss patients' pre-operative sleep concerns and expectations, allowing for personalized post-operative care and support.

P162

FUNCTIONAL OUTCOMES FOLLOWING TOTAL HIP ARTHROPLASTY FOR DEGENERATIVE COXARTHROSIS

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Objective:
Total hip arthroplasty has revolutionized the management of chronic and disabling hip conditions, restoring function and improving quality of life. Our objective is to evaluate the functional outcomes of patients undergoing total hip arthroplasty for degenerative coxarthrosis using generic instruments: the Postel-Merle d'Aubigné (PMA) score and the Hip Disability and Osteoarthritis Outcome Score (HOOS).

Material and Methods:
This retrospective, descriptive, and analytical cross-sectional study included 100 patients who underwent total hip arthroplasty for degenerative coxarthrosis over a four-year period. Data was collected through interviews and phone calls using the specific scoring systems.

Results:
The mean age was 49 ± 15.59 years, with a male predominance. Most patients resided in urban areas (81%). The left hip was more commonly affected (60.3%), and preoperative complaints included pain (94.9%), limping (49.4%), and reduced walking distance (35.9%). The majority (64.9%) received metal-on-polyethylene implants, while 35.1% had ceramic-on-ceramic implants.

All patients were mobilized on the first postoperative day. Rehabilitation was provided to 94.9% of patients for an average of 25 days. At the one-year follow-up, 79.5% of patients walked without assistance, 14.1% used one cane, and 3.8% used two canes.

Both the PMA and HOOS scores showed significant improvements postoperatively. The PMA score increased from 7 preoperatively to 14 postoperatively, indicating improved function. The HOOS score also demonstrated significant improvement, with the overall score rising from 35 to 76 postoperatively.

A positive and statistically significant association was found between the post-operative HOOS score and living environment, bearing surface (metal-on-polyethylene vs. ceramic-on-ceramic), age of the patient, time to standing and postoperative PMA score.

Conclusion:
The study clearly demonstrates the significant improvement in functional outcomes following total hip arthroplasty, as measured by both the PMA and HOOS scores. The use of standardized scoring systems allows for a more comprehensive assessment of patient outcomes and facilitates tailored treatment plans.

P163

MANAGEMENT OF PELVIC GIANT CELL TUMOR: AN INTERESTING ALTERNATIVE

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Objective:
Pelvic giant cell tumors present a significant surgical challenge due to their complex location and potential for local aggressiveness. While typically benign, these tumors can exhibit aggressive local growth, often involving the end of long bones and extending into the joint. Less frequently, they arise in flat bones, including the innominate bone of the pelvis. Recent advancements include the introduction of Denosumab, a human anti-RANKL monoclonal antibody, and the utilization of 3D-printed models for enhanced surgical planning.
Case Report:
This report describes the case of a 21-year-old male who presented with a painful swelling on the left side of his pelvis. Physical examination revealed a hard, tender mass in the posterior left pelvis without any neurovascular compromise.
Radiographic imaging, including X-ray, CT scan, and MRI, confirmed a large (9x8x7cm) osteolytic lesion in the posterior-superior aspect of the left ilium, extending into the sacroiliac joint. Pathological examination of the lesion confirmed a diagnosis of giant cell tumor.
A neoadjuvant treatment regimen of nine 120mg doses of Denosumab was administered with appropriate monitoring.
Preoperative planning was significantly enhanced by the use of a 3D-printed model of the pelvis. Surgical resection was performed via a posterior sacroiliac approach. Intraoperatively, the surgical planes were found to be well-defined, facilitating complete tumor removal. To address the resulting pelvic ring instability, reconstruction was performed using single-axis pedicle screws placed in the fourth and fifth lumbar vertebrae and the ilium. A fibular strut graft was utilized to bridge the bone defect. The patient experienced an uneventful postoperative recovery.
Discussion:
Denosumab, this anti-RANKL antibody has emerged as a valuable neoadjuvant therapy for GCTs, contributing to tumor size reduction and potentially improving surgical resectability and reducing recurrence rates.
3D-Printed models provide invaluable tools for preoperative planning, enhancing surgical accuracy, and facilitating better communication within the surgical team.
Conclusion:
The optimal management of pelvic giant cell tumors necessitates a multidisciplinary approach involving oncologists, orthopedic surgeons, and other specialists to develop personalized treatment plans. Close postoperative surveillance is crucial for early detection and management of any potential recurrence.

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Conclusion:
The optimal management of pelvic giant cell tumors necessitates a multidisciplinary approach involving oncologists, orthopedic surgeons, and other specialists to develop personalized treatment plans. Close postoperative surveillance is crucial for early detection and management of any potential recurrence.

P165

OSTEOMYELITIS OF THE SUPERIOR PUBIC RAMUS: AN UNCOMMON LOCALISATION

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Objective:
Osteomyelitis of the pubic bone is an uncommon condition, accounting for approximately 2% of all hematogenous osteomyelitis cases. Diagnosis can often be challenging, as its presentation may mimic other conditions such as osteitis pubis, pubic symphysis fracture, or non-infectious inflammation.
Case Report:
This report describes a 19-year-old male who presented with ten days of worsening pelvic pain. Initially, he experienced spontaneous pelvic pressure without systemic symptoms like fever or chills. Subsequently, he developed progressively severe pain in his left hip and groin.
Three days prior to presentation, he was evaluated in the emergency department but discharged with pain medication. However, his pain worsened, and he returned to the emergency department with fever at 39°C, tachycardia, pain radiating into the left buttock with inability to bear weight on his left lower extremity.
Laboratory investigations revealed elevated inflammatory markers with a White Blood Cell Count (WBC): 23,300 cells/µL and a C-reactive protein (CRP): 172 mg/L.
Based on these findings, an MRI of the pelvis was ordered, which revealed osteomyelitis of the pubic bone with endopelvic spread. Surgical intervention was performed, including a wedge resection of the infected bone. Tissue cultures subsequently grew Staphylococcus aureus, confirming the diagnosis of osteomyelitis pubis with an abscess extending into the adductor compartment.
The patient received intravenous antibiotic therapy for three weeks followed by an additional three weeks of oral antibiotics. At the four-month follow-up, the patient was pain-free, inflammatory markers had normalized, and a CT scan demonstrated resolution of the osteomyelitis.
Conclusion:
Osteomyelitis of the pubic bone is a rare but potentially life-threatening condition that should be included in the differential diagnosis of patients presenting with acute onset pelvic pain of unknown etiology.
Early diagnostic evaluation, including MRI or CT imaging, is crucial for prompt diagnosis and initiation of appropriate treatment. Definitive diagnosis often relies on microbiological confirmation through a bone biopsy obtained during surgical debridement, aspiration of abscesses or sampling of infected tissues at the site of entry.
Treatment typically involves a combination of surgical debridement to remove infected bone and tissue and prolonged antibiotic therapy for effective eradication of the infection.

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RADIUS BIPOLAR FRACTURE: A RARE AND UNIQUE INJURY

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Objective:
Simultaneous ipsilateral distal radius and radial head fractures, termed "radius bipolar fracture," represent a unique and uncommon injury. Few cases have been reported, and its incidence remains unknown.
Case Report:
A 32-year-old healthy male presented to the emergency department with right elbow and wrist pain following a slip and fall on stairs. He was unable to move the elbow or wrist, though finger movement and sensation remained intact. Radiographs revealed a radius bipolar fracture: a Mason type I radial head fracture and an AO type C1 (C1.3) distal radius fracture.
The patient underwent surgery. Traction with counter-traction facilitated distal radius reduction, followed by percutaneous K-wire fixation. The undisplaced radial head fracture was treated conservatively.
Post-operatively, an above-elbow cast was applied with the forearm in mid-prone position. Elbow mobilization began three weeks post-surgery, followed by cast and K-wire removal and gradual wrist motion. At six-month follow-up, both wrist and elbow demonstrated good range of motion.
Discussion:
Distal radius fractures are often associated with elbow dislocations, but rarely with proximal radius fractures. The most probable mechanism for this injury is a fall on an outstretched hand.
While treatment guidelines exist for individual radial head and distal radius fractures, there are no specific protocols for radius bipolar fractures.
If both fractures require surgical intervention, the order of surgery is crucial. If a radial head replacement arthroplasty is planned, it is recommended to operate on the wrist first. This preserves radial length and prevents radiocapitellar overstuffing or instability. However, if open reduction and internal fixation is performed for the proximal radius fracture, the order of surgery is less critical.
Conclusion:
Currently, no specific treatment guidelines exist for radius bipolar fractures. This case suggests a potential treatment algorithm: prioritize treating the distal radius fracture if open reduction is planned for the radial head. Surgical and postoperative care must address both the elbow and wrist, with a primary focus on preserving radial length to optimize outcomes.

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RESULTS OF PERCUTANEOUS PINNING FOR METACARPAL FRACTURES: A SERIES OF 70 CASES

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Objective:
Metacarpal fractures are common injuries of the upper extremity. Approximately 25% of these fractures require surgical intervention.
Material and Methods:
This retrospective study analyzed 70 cases of metacarpal fractures treated with percutaneous pinning between 2020 and 2022. Pinning techniques included fasciculated, Iselin, metacarpocarpal, and cruciate methods. Outcomes were assessed based on fracture reduction, healing, return to work, and the presence of complications.
Results:
The study population was predominantly male (88.6%). Right-hand injuries were more common (73%). Most frequent mechanisms of injury were falls on the dorsum of the hand (35%) and punches (25%).
Fifth metacarpal fractures were most frequent (36 cases), with neck fractures (53%) and base fractures (30%) being the most common subtypes.
First metacarpal fractures were the second most common (25 cases), with base fractures accounting for 88% of cases.
Surgery was performed within 24-48 hours in 55 cases. Pinning techniques included fasciculated centromedullary (31 cases), Iselin (22 cases), metacarpocarpal (13 cases), and cruciate (4 cases).
Pins were typically removed after 23 days. With a mean follow-up of 2.5 years, 78% of cases demonstrated favorable outcomes with complete healing and no sequelae.
Minor complications, such as joint stiffness or pin site infection, occurred in a few cases and were successfully managed with rehabilitation and medical treatment.
Patients were able to return to normal activities an average of 20 days after pin removal.
Conclusion:
Percutaneous pinning is an attractive treatment option for metacarpal fractures, offering good results, relative ease of technique, and cost-effectiveness. However, limitations include the potential for rotational malalignment, insufficient absolute stability, pin migration, and pin site infection.

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SCAPHOID FRACTURE WITH FRAGMENT EJECTION: A RARE CASE REPORT

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Objective:
Scaphoid fractures with fragment ejection are rare injuries in carpal trauma. They are often caused by high-energy mechanisms.
Case Report:
A 38-year-old right-handed construction worker presented to the emergency department following a three-meter fall onto his left wrist. Examination revealed a swollen, immobile wrist with signs of acute carpal tunnel syndrome. A palpable, hard, mobile mass was noted on the anterior aspect of the wrist. Radiographs showed a body fracture of the left scaphoid with a proximal fragment. Emergency surgery revealed a perinervous hematoma and a free proximal scaphoid fragment that had lost its ligamentous attachments. The fracture was reduced and stabilized with a screw, and the scapholunate ligament was repaired. Postoperatively, the patient was immobilized in a volar splint for six weeks, followed by physical therapy. At one-year follow-up, the patient had a painless wrist with near-normal mobility.
Discussion:
Scaphoid fractures with proximal fragment ejection are uncommon and are often associated with trans-scapholunate dislocations. In this case, the anterior and proximal avulsion of the scaphoid fragment was likely due to the high-energy impact and associated ligamentous ruptures.
Several surgical techniques can be used to treat these complex injuries, including scaphoid screw fixation and scapholunate interposition. In this case, we opted for fracture reduction with screw fixation and ligament repair. The literature reports a case of anterior-brachial avulsion of the lunate and proximal scaphoid fragment associated with an open trans-scapholunate-retro-lunate dislocation of the carpe, which was treated with a partial proximal carpectomy, leaving the distal scaphoid fragment in place. This patient achieved a good anatomical and functional outcome at six-year follow-up.
Scaphoid fractures with proximal fragment ejection can lead to complications such as nonunion, avascular necrosis, and carpal instability.
Conclusion:
Scaphoid fractures with proximal fragment ejection are rare but challenging injuries. Stabilization of the fracture with screw fixation and ligament repair offers a viable treatment option and can yield satisfactory anatomical and functional results.

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SLEEP DISTURBANCES IN ELDERLY INDIVIDUALS FOLLOWING HIP FRACTURES

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Objective:
Sleep disturbances are prevalent among the elderly and pose a significant challenge following hip fractures. These fractures, often a consequence of falls, can disrupt sleep patterns and exacerbate existing sleep problems. Our objective is to investigate the prevalence of sleep disturbances in elderly hip fracture patients and identify associated risk factors.
Material and Methods:
This study included patients who had undergone treatment for a hip fracture. Data collection involved a questionnaire assessing medical history, fall circumstances, time spent on the ground, availability of support, self-esteem, and sleep quality using the Pittsburgh Sleep Quality Index (PSQI).
Results:
The study included 80 patients (56 women and 24 men) aged 59 to 94 years. For 78.9% of these patients, the fracture resulted from their first fall. Slipping was the most common cause of the fall in 47.4% of cases, while syncope accounted for 5.3%. In 15.8% of cases, the patient remained on the ground for more than an hour. A support system was available in 57.9% of cases. Self-esteem was rated as very low in 37.1%, low in 21.1%, and average in 21.1%. Notably, 94.7% of patients reported poor sleep quality, highlighting the significant impact of hip fractures on sleep.
Our results show that most patients experienced their first fall leading to a hip fracture, suggesting that fall prevention is crucial for this population. Moreover, the prevalence of poor sleep quality was high, consistent with previous studies. The limited availability of a support system, reported in only 57.9% of cases, highlights the need for comprehensive care for elderly individuals following a hip fracture.
Conclusion:
Sleep disturbances are a significant concern for elderly individuals following hip fractures. This study highlights the high prevalence of poor sleep quality in this population and emphasizes the importance of comprehensive care that addresses not only the physical but also the psychological and social needs of these patients.

P170

SLIPPED CAPITAL FEMORAL EPIPHYSIS IN ADOLESCENTS: A SERIES OF 20 CASES

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Objective:
Slipped capital femoral epiphysis is a condition where the head of the femur slips backward relative to the neck.
This study aimed to investigate the clinical and radiological characteristics of slipped capital femoral epiphysis, as well as the various treatment modalities and short-to-medium-term outcomes.
Materiel and Methods:
This retrospective study included 20 patients diagnosed with slipped capital femoral epiphysis over a nine-year period. We used the Loder classification to categorize slips as stable or unstable, and the Carlioz classification to assess the severity of the slip based on the slip angle. Outcomes were assessed using a four-category scoring system.
Results:
The mean age at diagnosis was 14 years for boys and 12.8 years for girls, with a male predominance (85%). A history of minor trauma and obesity was reported in 55% and 50% of cases, respectively. Thirteen cases (65%) were stable, and seven (35%) were unstable. The disease course was acute in 5 cases (25%), chronic in 8 (40%), and acute on chronic in 7 (35%). The slip was classified as stage I in 10 hips (50%), stage II in 8 (40%), and stage III in 2 cases (10%). All patients received medical treatment with analgesics and anti-inflammatory drugs. Surgical treatment involved in-situ pinning in 80% of cases and pre-reduction pinning in 20%. At a mean follow-up of 4 years, outcomes were very good in 8 hips (40%), good in 9 (45%), fair in 1 (5%), and poor in 2 (10%). Complications included pin breakage in one case (5%) and articular impingement in another (5%). Three hips (16%) developed a slip in the contralateral hip after a mean of 1 year and 4 months.
Conclusion:
Slipped capital femoral epiphysis is no longer a rare condition and should be considered in overweight adolescents. The etiology remains unclear. Treatment varies depending on the severity of the slip. Early diagnosis and appropriate management are crucial for optimal outcomes.

P171

SUBACUTE OSTEOMYELITIS: A DIAGNOSTIC AND THERAPEUTIC CHALLENGE

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Objective: Subacute osteomyelitis can present with subtle and often misleading features, leading to diagnostic delays. Characterized by insidious onset and a relatively indolent course, it frequently involves the metaphyseal region of long bones.
Case Report: A 12-year-old child presented to the orthopedic emergency department with a five-week history of inflammatory knee pain. There was no history of trauma, and the child was otherwise healthy.
Physical examination revealed a localized swelling adjacent to the anterior tibial tuberosity, a restricted and painful range of motion of the knee, a tenderness to palpation over the proximal tibial metaphysis and absence of fever or skin inflammation
Laboratory investigations showed: White Blood Cell Count (WBC): 10,000 cells/µL and C-reactive protein (CRP): 171 mg/dL
Plain radiograph of the knee demonstrated a rounded, well-defined lytic lesion with surrounding sclerosis in the proximal tibial metaphysis. Magnetic Resonance Imaging (MRI) revealed a central fluid-filled bone lesion with a "target" appearance, characteristic of a Brodie's abscess.
Surgical debridement of the abscess was performed and culture of the abscess fluid yielded Staphylococcus aureus.
Intravenous antibiotics were administered for one week, targeting Staphylococcus aureus (oxacillin and ciprofloxacin). This was followed by a four-week course of oral antibiotics.
The patient experienced a favorable postoperative course with a significant reduction in inflammatory markers. At the one-year follow-up, the patient had made a full recovery with complete resolution of the infection on radiographic evaluation.
Conclusion: Brodie's Abscess is a chronic form of osteomyelitis typically presents insidiously, often with a delay in diagnosis (median of 12 weeks). It predominantly affects young males and commonly involves the tibia and femur.
MRI is the gold standard for diagnosing osteomyelitis, particularly in children, as it provides superior soft tissue contrast and better delineation of bone marrow involvement compared to plain radiographs.
Other imaging modalities, such as bone scintigraphy combined with CT, can offer high diagnostic accuracy, but may not be readily available in all settings.
Staphylococcus aureus remains the most common causative organism.
A multi-modal approach is typically required, including surgical debridement to remove infected bone and tissue, and prolonged antibiotic therapy to eradicate the infection.

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SURGICAL TREATMENT OF PROXIMAL HUMERUS FRACTURES: A COMPARATIVE STUDY OF PLATE FIXATION VERSUS INTRAMEDULLARY NAILING

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Objective: Proximal humerus fractures are common, particularly in the elderly. Only 15-20% require surgical intervention. The optimal surgical approach remains controversial, with intramedullary nailing (Kapandji technique) and plate fixation being the primary contenders.
Material and Methods: This retrospective study analyzed 90 cases of proximal humerus fractures treated over an eight-year period. Functional outcomes were assessed using the Constant Score. Radiographic outcomes were evaluated based on the criteria of the 1997 SOFCOT symposium.
Results: The study included patients aged 16 to 73 years, with an average age of 43 years. Women were slightly more prevalent.
Extra-articular fractures comprised 64.4% of cases, including 38 surgical neck fractures (42.2%) and 20 subtuberosity fractures with associated greater or lesser tuberosity fractures (22.2%).
Articular fractures accounted for 35.6% of cases, including two anatomical neck fractures (2.2%) and 30 greater tuberosity fractures (33.3%).
Forty-two patients underwent intramedullary nailing (Kapandji technique), while 48 received plate fixation.
Early surgical intervention (within four days) was associated with better functional outcomes. Plate fixation demonstrated significantly higher mean Constant scores (86.3) compared to intramedullary nailing (75.4).
Radiographic union was achieved more rapidly with plate fixation. However, there was no significant difference in the time to radiographic union between the two techniques.
Conclusion: 80-85% of proximal humerus fractures can be managed conservatively. Surgical intervention is indicated for unstable or severely displaced fractures.
While various surgical techniques exist, this study suggests that plate fixation may offer superior functional and radiological outcomes compared to intramedullary nailing.

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SYNOVIAL SARCOMA OF THE MIDFOOT: A RARE CASE REPORT

A. Fekih[1], J. Saadana[1], I. Ben Massaoud[1], R. Dhouibi[1], A. Ltifi[1], A. Dhouib[1], A. Lassoued[1], I. Aloui[1], A. Abid[1], I. Haddada[2]

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Objective:
Synovial sarcoma is a rare and aggressive soft tissue sarcoma, accounting for 8-10% of all soft tissue sarcomas. While typically diagnosed in young adults (median age 35), it can occur across a wide age range (5-85 years) with a slight male predominance.
This tumor commonly arises near joints and tendons, with the extremities being the most frequent sites of involvement. Pulmonary metastases are the most common mode of distant spread.
Case report:
This report describes a 52-year-old male who presented with a one-month history of painful swelling in his left midfoot. Initially, an infectious etiology was suspected due to his rural background and the presence of fever.
Plain radiograph of the foot demonstrated a lytic lesion involving multiple tarsal bones and the CT scan revealed an extensive bone destruction of the midfoot with involvement of the hindfoot and forefoot. Additional MRI was used to better delineate the extent of bone involvement. This osseous invasion of this magnitude is uncommon in synovial sarcoma.
Histological examination of a biopsy specimen confirmed the diagnosis of a high-grade monophasic synovial sarcoma.
Given the extensive bone involvement, mid-leg amputation was performed.
Postoperatively, the patient received chemotherapy with ifosfamide and anthracyclines, as synovial sarcoma demonstrates moderate sensitivity to these agents.
The patient recovered well from surgery and was fitted with a prosthetic limb. At the one-year follow-up, he was satisfied with his prosthetic function and reported no complications or evidence of tumor recurrence on follow-up MRI.
Conclusion:
Synovial sarcoma should be considered in the differential diagnosis of any unexplained soft tissue mass, particularly in patients with risk factors.
Advanced imaging techniques, such as MRI and CT scan, are essential for accurate staging and surgical planning.
Surgical resection remains the cornerstone of treatment, often requiring wide local excision or limb-salvage procedures.
Adjuvant therapies, such as radiation therapy and chemotherapy, may be considered based on tumor characteristics and patient risk factors.
While significant improvements in survival have been observed in recent decades (5-year survival rates of 59-75%), long-term follow-up is crucial as recurrence can occur years after initial treatment

P174

WHAT IS THE THERAPEUTIC APPROACH FOR A MALUNION OF A BIMALLEOLAR FRACTURE ?

A. Fekih[1], J. Saadana[1], R. Dhouibi[1], A. Ltifi[1], A. Dhouib[1], A. Lassoued[1], I. Ben Massaoud[1], I. Aloui[1], A. Abid[1], I. Haddada[2]

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Objective:
Malunions following bimalleolar fractures can have severe consequences for the ankle joint. They often result from inadequate reduction or treatment of the initial fracture.
Case Report:
A 21-year-old male presented with a displaced bimalleolar fracture of the left ankle following a road traffic accident. Initial management involved open reduction and internal fixation (ORIF) with a plate and screws for the fibula and a screw for the tibia. Post-operative recovery was uncomplicated.
However, 60 days later, the patient returned with an ankle deformity following a weight-bearing incident. Radiographs revealed a varus malunion of the ankle with hardware failure. Revision surgery included an ankle arthrolysis, debridement of the non-union site, and stabilization with a plate and screws.
At the latest follow-up, the patient had achieved solid bone union with good ankle mobility and no pain during walking.
Discussion:
Bimalleolar fractures disrupt the bimalleolar fork while preserving the weight-bearing function of the tibial plafond. Displaced fractures are typically treated surgically to restore optimal joint anatomy. This approach minimizes the risk of complications associated with this type of fracture.
Any excessive pain on weight-bearing after a fracture, even within the expected healing timeframe, should prompt a thorough radiographic evaluation. Clinically, patients may complain of instability, malalignment, or difficulty weight-bearing.
The Skinner test can be a useful tool to assess the transverse alignment of the talus. An intra-articular malunion is diagnosed when a solid bony union exists but there is a persistent deformity that alters the joint surface, leading to abnormal weight-bearing and/or instability of the tibiotalar joint.
There is no single, standardized approach to managing intra-articular malunions. Surgical approaches are carefully planned based on the specific deformity and any previous incisions. Generally, surgery involves three steps: repositioning the talus, correcting the malunion with an osteotomy (bone cut) and/or grafting, and internal fixation to maintain the correction.
Conclusion :
Any pain on weight-bearing after an ankle fracture should raise suspicion of an intra-articular malunion. Radiographic findings may be subtle. Early detection allows for timely corrective osteotomies before the development of arthritis, which can complicate conservative management.

P175

RELATIONSHIP BETWEEN HEALTH LITERACY SKILLS AND WALKING BEHAVIOR TO PREVENT OSTEOPOROSIS AMONG HEALTHY VOLUNTEERS

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Introduction :
Health literacy is essential for adopting health-promoting behaviors, such as walking, which helps prevent osteoporosis. Improving health literacy enables individuals to understand health information and make informed decisions to reduce their risk of osteoporosis.
This study aims to determine the relationship between health literacy and the adoption of walking behaviors among healthy volunteers.
Methods :
A questionnaire based on the short version of the HELIA-SF (Health Literacy Instrument for Adults-Short Form) was administered to 33 volunteers to assess their health literacy.
The HELIA-SF is a 9-item validated questionnaire originally developed in German, designed to assess health literacy in adults. It measures the ability to comprehend and apply medical information, with higher scores indicating better health literacy.
Walking behavior was assessed as the average number of hours walked per week. Demographic data were collected using self-administered questionnaires.
Results :
The study included 33 volunteers (22 females and 11 males) with a mean age of 34.7 ± 11.8 years. Twenty-four participants (72,7%) had a university-level education, while 9 participants (27,3%) had a secondary-level education.
Nineteen participants reported walking, with an average of 1.39 ± 1.98 hours per week.
The mean health literacy score was 3.8 ± 1.01, with 63.6% classified as having good literacy, 27.3% as having moderate literacy, and 6.1% as having poor literacy.
A significant correlation was observed between health literacy and educational level ($p < 0.001$).
No significant correlations were found between walking behavior and health literacy ($p = 0.13$), age ($p = 0.52$), or educational level ($p = 0.58$).
Conclusion :
No significant relationship was found between health literacy and walking behavior. However, the strong link between health literacy and education highlights the need for targeted interventions to enhance health literacy and encourage preventive behaviors like walking to reduce osteoporosis risk.

P176

APPLICATION OF FRAX-BRAZIL 2.0 IN WOMEN WITH GYNECOLOGICAL MALIGNANT NEOPLASIA

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[1]University of Campinas, Campinas, Brazil

Objective: To compare the risk of osteoporotic fractures between women with and without a history of gynecological cancer.
Methods: A prospective study with climacteric women with and without gynecological cancer. Participants were included in a 1:1 ratio, matched by age/menstrual pattern. Data were collected in a tertiary hospital between 11/2022 and 12/2024. The dependent variable was the fracture risk score, calculated using FRAX-Brazil 2.0 and classified according to the recommendations of the National Osteoporosis Guideline Group (NOGG), calculated with and without bone mineral density (BMD). The study was approved by the national Ethics Committee.
Results: 188 women, with a mean age of 51.4 (±7.6) years, were included. 48.9% had a history of gynecological cancer. In the FRAX analysis without BMD for the risk of major osteoporotic fractures, 99 (52.7%) were classified as low risk, 79 (42%) as intermediate, 3 (1.6%) as high, and 7 (3.7%) as very high. No differences in risk were observed when comparing women with and without cancer ($p=0.27$). 33 women (17.5%) underwent BMD testing. In the FRAX analysis with BMD for the risk of major osteoporotic fractures, 27 (81.8%) were classified as low, 5 (15.2%) as high, and 1 (3%) as very high. No differences in risk were observed ($p=0.61$). In the FRAX analysis with BMD for hip fracture risk, 25 (75.8%) were classified as low, 5 (15.2%) as high, and 3 (9%)as very high. No differences in risk were observed ($p=0.73$). From the 79 women that were classified as intermediate risk in the analysis without BMD, only 17 (21.5%) underwent the test. Of these, 4 (23.5%) were reclassified to high risk for major osteoporotic fracture and 6 (35.3%) were reclassified to high/very high risk for hip fracture.
Conclusion: A history of gynecological cancer did not influence the risk of fractures. Approximately 35% of women with intermediate risk in the FRAX assessment may not receive the correct treatment if they do not undergo BMD testing.

P177

THE LONG TERM RESULTS OF TREATMENT AND REHABILITATION OF MULTIPLE SCLEROSIS PATIENTS

A. Filipovich[1]

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Methods: Long term results of treatment of multiple sclerosis were studied. The dynamic monitoring of 110 patients over the period of 1 to 1.5 years following the successful inhospital treatment of MS was carried out. Clinical methods, CT and MRI of cerebrum and spinal cord, and a patented radioimmunobiological assay of the myelinotoxic activity (MTA) of blood serum were used. Results: Four groups of patients were distinguished: group 1 (36 patients; 32.7%) – patients with low MTA level (4.56*0.7 units) after successful hormone therapy. No rehabilitation was required out afterwards. Group 2 included 41 patients (37.3%) with low MTA level (3.76*0.81) after hormone and corrector therapy; a rehabilitation course was carried out at a later stage. Group 3 consisted of 22 patients (20.0%) that required long term immunomodulating therapy due to a higher rate of demyelinisation (MTA = 19.2*0.43). The remaining 11 patients (group 4, 10.0%) with moderate rate of demyelinisation (16.4*0.52) were prescribed general health improvement therapy and rehabilitation based on intensive motional activity and physical exercise. Conclusions. Hormone therapy helps to reduce the demyelinisation rate to acceptable level within 2 to 4 month. The subsequent rehabilitation helps to achieve the extended remission period. However, long time after treatment of acute MS the hormone therapy is not justified.

P178

DIFFERENTIAL DIAGNOSIS AND TREATMENT OF MYOTONIC AND MYOFASCIAL SYNDROMES OF NECK PAIN

A. Filipovich[1]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Objectives: The dynamic monitoring of 195 patients with myotonic and myofacial syndromes of neck pain was done against the control group of 45 people.
Methods: MRI of cervical and vertebrocranial areas of spinal column, electromyography of 7 to 9 relevant muscles, finding of the "key" muscle and the overall computer aided assessment of osteomuscular, cardiorespiratory and oxygen transport system disorders. Results: Clinical and electromyographic criteria for diagnosis of myotonic and myofascial syndromes of neck pain were identified based on the occurrence rates. The role of major system disorders in pathogenesis of neurological manifests of neck pain was studied. New therapeutic approaches to stopping pain and myotonic syndromes were developed; the effectiveness of early rehabilitation measures was demonstrated. The prevailing myotonic syndromes were identified which were the musculus obliquus capitis inferior syndrome (in 68, or 39.4% patients); superscapular area syndrome (33% of patients); musculus scalenus anterior and musculus scalenus medius syndromes (18.9%); musculus pectoralis minor syndrome (9.7%).
Hypodynamia caused system disorders were noted in 78.3% patients including excessive body mass and fat content; reduced blood circulation rate and heartbeat volume and the pronounced decrease of PWC170. The most informative spondylographic findings were reduced thickness of posterior areas of intervertebral disks from CI to CVII (52.3 to 77.9% of patients), cervical lordosis impression (76.4%) and uncovertebral arthroses (58.2%).
Conclusions: The most seriously affected ("key") muscles in neck pain patients were found. Diagnosis and treatment strategies for neck pain patients were developed

P179

TECHNICAL MEANS OF REHABILITATION FOR PATIENTS WITH LOW BACK PAIN

A. Filipovich[1]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Background and Aims: 78 patients with myotonic (MT) syndrome Methods: Patients went through the clinical estimation of neurologic status, manual testing of muscles, CT and MRI of back bone lumbar department, interferential and needle electromyography of the most damaged muscular groups, dosed loading veloergometry, revasography of feet, and shins. Results: Medical-rehabilitation complex on damaged extremity was approbated in 27 patients with MT syndrome. The complex included oral reception of katadolon (100 mg 3 times a day for 10days), tractions on Fintrac-471 table (with force from 3 to 55 kg, a course of 8-10 sessions) and also acupuncture with use acupuncture points of general action with vascular autonomic nervous system orientation (G14, MJ6, E36, RP6, TR5, V40) and locally-segmented points on the most damaged muscular groups (AT60, VB30 with deep introduction to piriform muscle; VB 34, VB41, F3). Conclusions: After treatment damaged extremity pain has completely disappeared in 19 patients, pain essentially decreased and increased tolerance of physical activity in 6 patients. It is established, that katadolon shows not only analgesic and neuroprotective, but also myorelaxing action on muscles of pelvic girdle and feet in patients with acute and chronic pain syndrom.

P180

DIFFERENTIAL DIAGNOSIS AND TREATMENT OF MYOTONIC AND MYOFASCIAL SYNDROMES OF NECK PAIN

A. Filipovich[1]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Objectives
The dynamic monitoring of 195 patients with myotonic and myofacial syndromes of neck pain was done against the control group of 45 people.
Methods
MRI of cervical and vertebrocranial areas of spinal column, electromyography of 7 to 9 relevant muscles, finding of the "key" muscle and the overall computer aided assessment of osteomuscular, cardiorespiratory and oxygen transport system disorders.
Results
Clinical and electromyographic criteria for diagnosis of myotonic and myofascial syndromes of neck pain were identified based on the occurrence rates. The role of major system disorders in pathogenesis of neurological manifests of neck pain was studied. New therapeutic approaches to stopping pain and myotonic syndromes were developed; the e□ectiveness of early rehabilitation measures was demonstrated. The prevailing myotonic syndromes were identified which were the musculus obliquus capitis inferior syndrome (in 68, or 39.4% patients); superscapular area syndrome (33% of patients); musculus scalenus anterior and musculus scalenus medius syndromes (18.9%); musculus pectoralis minor syndrome (9.7%).
Hypodynamia caused system disorders were noted in 78.3% patients including excessive body mass and fat content; reduced blood circulation rate and heartbeat volume and the pronounced decrease of PWC_{170}. The most informative spondylographic findings were reduced thickness of posterior areas of intervertebral disks from CI to CVII (52.3 to 77.9% of patients), cervical lordosis impression (76.4%) and uncovertebral arthroses (58.2%).
Conclusions
The most seriously a□ected ("key") muscles in neck pain patients were found. Diagnosis and treatment strategies for neck pain patients were developed.

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TECHNICAL MEANS OF REHABILITATION FOR PATIENTS WITH LOW BACK PAIN

A. Filipovich[1]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Background and Aims
78 patients with myotonic (MT) syndrome
Methods
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PATHOGENESIS OF COGNITIVE NEUROSIS-LIKE DISORDERS IN PATIENTS WITH INITIALLY CHRONIC VIRAL ENCEPHALITIS

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Methods: brain MRI, research of cerebrospinal fluid and its dinamic, definition of a spectrum of 20 basic amino acids in blood serum and liquor
Results: 126 patients with initial chronic viral encephalitis were surveyed. The most significant and informative appeared the decrease in free amino acids: serine (5,12±0,15mg/l; P< 0,01), glycine (6,59±0,2mg/l; P< 0,001), histidine (5,11±0,12mg/l; P< 0,05), alanine (12,93±0,12mg/l; P< 0,001), arginine (5,62±0,09mg/l; P< 0,001), tyrosine (5,08±0,09mg/l; P< 0,001), meteonin (2,19±0,12mg/l; P< 0,001), phenylalanine (3,36±0,14mg/l; P< 0,001), lysine (6,94±0,17mg/l; P< 0,001), leucine (4,64±0,14mg/l; P< 0,001), threonine (6,2±0,14mg/l; P< 0,001), glutamic acids (2,99±0,16mg/l; P < 0,001) at simultaneous increase in concentration of tryptophan (7,36±0,12mg/l; P < 0,001). Among the connected amino acids in CMЖ the reliable increase, in comparison with control group healthy participants was observed, glycine (11,44±0,13mg/l; P < 0,001), histidine (6,12±0,11mg/l; P< 0,001), methionine (5,86±0,07mg/l; P < 0,01), lysine (19,42±0,16mg/l; P < 0,001), leucine (18,94±0,14g/l; P< 0,01), threonine (18,94±0,14mg/l; P < 0,001), glutamic acids (9,69±0,17mg/l; P < 0,001).
Conclusion: In pathogenesis of cognitive neurosis like disorders in patients with initial chronic viral encephalitis the great importance has the decrease in content of the majority

free and bonded amino acids in cerebrospinal fluid and blood serum (alanine, glycine, glutamic acids, leucine, methionine, threonine, tryptophan, phenylalanine) at simultaneous increase of tryptophan, that it must be considered atcarrying out of therapeutic actions.

P183

SOME ASPECTS OF REHABILITATION FOR PATIENTS WITH LOW BACK PAIN

A. Filipovich[1]

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Objectives: Examination of 78 patients with myotonic (MT) syndrome of lumbar osteochondrosis. Methods
Patients went through the clinical estimation of neurologic status, manual testing of muscles, CT and MRI of back bone lumbar department, interferential and needle electromyography of the most damaged muscular groups, dosed loading veloergometry, revasography of feet, and shins.
Results: It was established for the first time, that among MT-syndrome patients 54 (69,2 %) an associated damage of two or more muscles prevailed. The most damaged ("key") muscles appeared to be gastrocnemius muscle (43; 55,1 %), gluteus medius (42; 53,82 %), quadriceps femoris (36; 46,2%), rectus abdominis and external oblique (32; 41,1 %), peroneal muscle (29; 37,2 %), piriform muscle (29; 37,2 %), lumbar quadrate muscle (28; 35,9 %), gluteus maximus (19; 24,3 %), gluteus minimus (16; 20,5 %), adductor (14; 17,9 %) and abductor (9; 11,5 %) thigh muscles.Medical-rehabilitation complex on damaged extremity was approbated in 27 patients with MT syndrome. The complex included oral reception of katadolon (100 mg 3 times a day for 10 days), tractions on Fintrac-471 table (with force from 3 to 55 kg, a course of 8-10 sessions) and also acupuncture with use acupuncture points of general action with vascular autonomic nervous system orientation (G14, MJ6, E36, RP6, TR5, V40) and locally-segmented points on the most damaged muscular groups (AT60, VB30 with deep introduction to piriform muscle; VB 34, VB41, F3)
Conclusion: After treatment damaged extremity pain has completely disappeared in 19 patients

P184

IMMUNOLOGICAL DISORDERS IN MULTIPLE SCLEROSIS PATIENTS WITH THE PRESENCE OF FOOD ALLERGY

A. Filipovich[1]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Background and Aims
102 multiple sclerosis patients 19 to 33 years old were examined against the control group of 20 healthy people.
Methods
MRI and immunological studies
Results
All patients on the level of IgE in blood serum of 20 basic food products are divided into four groups: the first (13 pers, 12.7%) with the absence of IgE in serum, second (29 pers., 28.5%) with the presence of IgE (threshold 0,35-0,69 IU / ml); third (45 pers., 44.1%) with a moderate increase in IgE (0,70-3,49 IU / ml); 4 st (15 pers., 14.7%) with a significant increase in IgE (3,50-17,49 IU / ml) in serum. Patients first group without clinical signs of apparent exacerbation of MS were observed in blood eosinophilia, and the brain MRI revealed hyperintense foci in a single T-2W mode, indicating the absence of active demyelinating process.
Patients with the second group with a slow chronic course of MS were determined by individual eosinophils (18.1%), indicating that they have a weak allergic reaction. Identification of individual hypo-and hyperintense lesions on brain MRI evidence of chronic course of demyelinating process in the presence of rare clinical exacerbations was seen by us as secondary progressive MS. In the third group investigated the apparent worsening of the process of clinical signs detected a moderate increase in serum IgE (45 pers., 44.1%) in the presence of explicit eosinophilia (11.8%).
Conclusions
Markers of exacerbation of MS is the simultaneous moderate increase in serum IgE eosinophilia, and the appearance of new lesions on MRI brain.

P185

REHABILITATION TECHNOLOGY OF PATIENTS WITH SYMPTOMATIC EPILEPSY

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OBJECTIVE:220 patients with symptomatic epilepsy were examined.
MATERIAL-METHODS: Neurological examination, MRI, EEG.
RESULTS: Prepared technology rehabilitation of patients with symptomatic epilepsy caused by organic diseases of the central nervous system. The technology is intended for use by inpatient and outpatient o□ces rehabilitation, medical and rehabilitation expert committees, clinics, health resorts organizations in order to improve the outcome of the disease, prevent the development of disability or reduced the severity of violations, Disability formed under disability. The technology includes: selection of the object and the subject of rehabilitation of rehabilitation; expert-rehabilitation diagnostics; evaluation of rehabilitation potential, rehabilitation prognosis; medical examination (with evaluation categories and the degree of Disability, the risk of disability); formation and practical implementation of individual rehabilitation programs; evaluation of the e□ectiveness rehabilitation and formation of further rehabilitation of the route.
CONCLUSION: With the formation of medical rehabilitation measures provided by the integrated use therapy, medical physical training, medication correction, physical therapy, dietetics, the organization "School of the patient."

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IMMUNOLOGICAL DISORDERS IN MULTIPLE SCLEROSIS PATIENTS WITH THE PRESENCE OF FOOD ALLERGY

A. Filipovich[1]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Background and Aims: 102 multiple sclerosis patients 19 to 33 years old were examined against the control group of 20 healthy people.
Methods: MRI and immunological studies
Results: All patients on the level of IgE in blood serum of 20 basic food products are divided into four groups: the first (13 pers, 12.7%) with the absence of IgE in serum, second (29 pers., 28.5%) with the presence of IgE (threshold 0,35-0,69 IU / ml); third (45 pers., 44.1%) with a moderate increase in IgE (0,70-3,49 IU / ml); 4 st (15 pers., 14.7%) with a significant increase in IgE (3,50-17,49 IU / ml) in serum. Patients first group without clinical signs of apparent exacerbation of MS were observed in blood eosinophilia, and the brain MRI revealed hyperintense foci in a single T-2W mode, indicating the absence of active demyelinating process. Patients with the second group with a slow chronic course of MS were determined by individual eosinophils (18.1%), indicating that they have a weak allergic reaction. Identification of individual hypo-and hyperintense lesions on brain MRI evidence of chronic course of demyelinating process in the presence of rare clinical exacerbations was seen by us as secondary progressive MS. In the third group investigated the apparent worsening of the process of clinical signs detected a moderate increase in serum IgE (45 pers., 44.1%) in the presence of explicit eosinophilia (11.8%).
Conclusions: Markers of exacerbation of MS is the simultaneous moderate increase in serum IgE eosinophilia, and the appearance of new lesions on MRI brain.

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SEVERE OSTEOPOROSIS IN A CASE WITH MULTIPLE RISK FACTORS AND RECENT TOTAL LEFT HIP ARTHROPLASTY

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Objective: To monitor the functional status of a patient with multiple risk factors and severe osteoporosis, with recent total left hip arthroplasty and determining the effectiveness of rehabilitation interventions, such as physical therapy and gait training programs.
Material and methods: A 68-year-old woman presented herself in our outpatient unit for: gait difficulties; pain in the left foot; right coxalgia; dorsalgia. The patient's medical history includes severe osteoporosis since 2020, chronic venous insufficiency; flat foot and hallux valgus bilateral; facet joint syndrome lumbar and a recent total left hip arthroplasty in 05.2024. For assessing bone mineral density (BMD) we used DXA. We assessed patient's grip strength using Jamar dynamometers at the first evaluation and the last evaluation. Walking ability and speed were assessed using 10m walking test and TUG(Time Up and Go) test at the time of the first evaluation and during last evaluation. She underwent complex rehabilitation therapy in our facility for 10 days including hydrokinetotherapy, individual kinetotherapy, LASER terapy, electromechanotherapy- Deep Oscilation.
Results and discussions: The muscle strength at last evaluation improved compared to the value measured at the first evaluation (26 kg vs 20 kg) reflecting enhanced upper body strength and overall functional capacity, which is essential for mobility and reducing fall risk. There was a slight improvement of gait speed at the last evaluation compared to first evaluation (1.8 m/s vs 1.05 m/s). TUG test revealed as well improvement at the final evaluation vs first evaluation(11.6 s vs 15.4). demonstrating improved balance, mobility, and reduced risk of falls DXA scores measured during the 2 weeks period of physical therapy were as follows: T-Score left hip: -3.5; T-Score right hip: -3.7; T-score lumbar spine: -3.8.
Conclusions: DXA high scores confirmed severe osteoporosis in this case emphasizing the need for continued management, including pharmacological treatment and preventive strategies. The results underline the importance of individualized, comprehensive rehabilitation programs in patients with severe osteoporosis, and long-term osteoporosis management is recommended to maintain and further improve functional independence while minimizing fall risk and associated complications.

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DETECTING PATIENTS WITH OSTEOPOROSIS USING NATIONWIDE CLAIM DATA IN IRAN

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Objective: Claim data are large-scale datasets offer valuable information for various epidemiologic applications. One application is the detection of patients by health systems, which can be used to estimate disease burden and formulizing individualized follow-up strategies. However, prescription data in many developing countries, including Iran, often lacks specific diseases diagnosis. This study aimed to develop a decision rule using prescription data from a public insurance organization in Iran to identify patients with osteoporosis.
Methods: This study utilized prescription data from the Iran Health Insurance Organization (IHIO) from 2014 to 2017 across 24 of 31 provinces of Iran. The IHIO is one of the largest public

insurance providers in Iran that covers approximately 50% of the population. Only prescriptions for patients aged ≥ 18 years without any missing values were included. Based on literature review and expert consultation, medications including G03XC01 (raloxifene), H05AA (parathyroid hormones and analogs), H05BA (calcitonin preparations), and M05BA (bisphosphonates) were selected as medication with potential usages for osteoporosis treatment. The drug prescription score and the generalized extreme studentized deviate test (GESDT) were used to develop decision rules.

Results: A total of 112,532,876 prescriptions from 14,785,795 patients (56.2% female) were evaluated. Medications potentially related to osteoporosis were prescribed 816,217 times. The exploratory analysis resulted in a decision rule that identified patients receiving at least one prescription for H05AA or H05BA as having osteoporosis. Receiving bisphosphonates were included in the decision rule unless prescribed by hematologists or radiotherapists, because their prescription could possibly be due to bone cancer treatment. Applying this rule identified 405,975 patients (2.75%) as having osteoporosis, with 109,085 (0.74%) diagnosed in the last year of the study. The prevalence of osteoporosis was higher in females (4%) compared to males (1%) and increased from 0.31% in the 18–24 age group to 5.65% in those aged 50–59 and 7.6% in those ≥ 75, peaking at 8.6% in the 60–74 age group. Prevalence varied by province, ranging from 1.4% in Hormozgan and Sistan and Baluchestan to 5% in Isfahan.

Conclusions: Previous studies indicated a prevalence of osteoporosis of 38% in women and 25% in men aged ≥ 50 in Iran (1). However, the prevalence detected through our prescription-based method was under 9% for above 50 years old age groups, suggesting underdiagnosis and undertreatment. Identifying patients with their initial prescriptions enables health systems to implement targeted follow-ups and strategies to prevent disease progression.

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DECOMPOSITION ANALYSIS OF FALL INCIDENCE CHANGES IN THE NORTH AFRICA AND MIDDLE EAST REGION FROM 1990 TO 2021

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Objective: Falls represent a significant public health concern due to their substantial impact on morbidity and quality of life. The North Africa and Middle East (NAME) region, characterized by rapid population growth and demographic shifts toward aging, offers a unique context to examine long-term trends in fall incidence. This study aims to understand the drivers of these changes over the past three decades, providing insights to inform targeted prevention strategies.

Methods: Data on fall incidence by year and sex were obtained from the Global Burden of Diseases (GBD) 2021 repository. Estimates were reported with 95% uncertainty intervals (95% UIs). Decomposition analysis was conducted under two scenarios: (1) applying 1990 age-specific incidence rates to the 2021 population to isolate the effect of population growth, and (2) applying 1990 age-specific rates while accounting for changes in age structure and sex distribution. Differences between observed and estimated cases in these scenarios were attributed to population growth, population aging, and changes in age-specific incidence rates.

Results: From 1990 to 2021, the total fall incidence in the NAME region increased by 106.0% (95% UI: 93.7 to 119.5), rising from 6.9 million (6.0 to 8.1) to 14.3 million (12.7 to 16.2). However, the age-standardized fall incidence rate per 100,000 population showed a smaller increase of 19.3% (15.4% to 23.7%) during the same period, from 1,911.8 (1,692.7 to 2,192.1) to 2,281.7 (2,042.5 to 2,564.7). In 2021, the highest age-standardized rates per 100,000 population were observed in Qatar (3,371), the United Arab Emirates (3,463), and Oman (3,054), while the lowest rates were reported in Afghanistan (1,243), Egypt (1,314), and Yemen (1,459). Decomposition analysis revealed that the increase in fall incidence was primarily driven by population growth (83.7%) and changes in age-specific incidence rates (30.6%), while population aging contributed negatively (-8.4%). Most countries followed a similar pattern, with population growth as the dominant factor. However, some countries, such as Qatar and Saudi Arabia, exhibited distinct patterns (Table 1).

Conclusions: Fall incidence in the NAME region has significantly increased, primarily due to population growth and changes in age-specific rates, while population aging has had a negative contribution. Despite progress in controlling falls among older adults, the region's growing population necessitates improved and targeted prevention strategies for all age groups.

Table 1. Decomposition analysis of fall incidence between 1990 to 2021 in North Africa and Middle East and its countries.

	New cases		Expected new cases		Contribution of each factor			
location	1990	2021	Population growth	Population growth + Aging	Population growth (%)	Population aging (%)	age-specific Incidence rate change (%)	Overall change (%)
North Africa and Middle East	6,937,401	14,287,406	12,742,056	12,159,868	83.7	-8.4	30.6	105.9
Afghanistan	128,696	419,394	404,103	438,040	214	26.4	-14.5	225.9
Algeria	595,337	927,878	1,040,518	944,980	74.8	-16	-2.9	55.9
Bahrain	8,712	31,376	26,311	25,002	202	-15	73.1	260.1
Egypt	687,407	1,415,813	1,312,212	1,269,047	90.9	-6.3	21.4	106
Iran	1,364,055	1,742,010	2,039,052	1,836,861	49.5	-14.8	-7	27.7
Iraq	420,508	811,802	941,238	918,799	123.8	-5.3	-25.4	93.1
Jordan	74,870	244,965	247,006	235,124	229.9	-15.9	13.2	227.2
Kuwait	50,706	132,432	137,201	122,698	170.6	-28.6	19.2	161.2
Lebanon	44,499	107,280	82,402	83,191	85.2	1.8	54.1	141.1
Libya	87,238	138,504	142,200	133,232	63	-10.3	6.1	58.8
Morocco	502,393	777,850	736,572	694,720	46.6	-8.3	16.5	54.8
Oman	52,515	137,876	124,479	128,659	137	8	17.5	162.5
Palestine	46,621	129,274	116,970	116,383	150.9	-1.3	27.7	177.3

Qatar	15,023	114,123	100,538	103,507	569.2	19.8	70.7	659.7
Saudi Arabia	851,437	3,113,727	2,024,588	2,164,936	137.8	16.5	111.4	265.7
Sudan	342,322	841,324	742,373	754,590	116.9	3.6	25.3	145.8
Syrian Arab Republic	263,801	328,922	291,035	259,471	10.3	-12	26.4	24.7
Tunisia	170,739	247,297	242,170	211,762	41.8	-17.8	20.8	44.8
Türkiye	978,036	1,775,516	1,422,854	1,262,400	45.5	-16.4	52.4	81.5
United Arab Emirates	57,158	321,235	294,243	257,059	414.8	-65.1	112.3	462
Yemen	191,534	515,483	472,616	483,337	146.8	5.6	16.7	169.1

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MORBIDITY ATTRIBUTABLE TO LOW BONE MINERAL DENSITY SHOULD TAKE PRIORITY OVER ATTRIBUTABLE MORTALITY IN THE NORTH AFRICA AND MIDDLE EAST REGION

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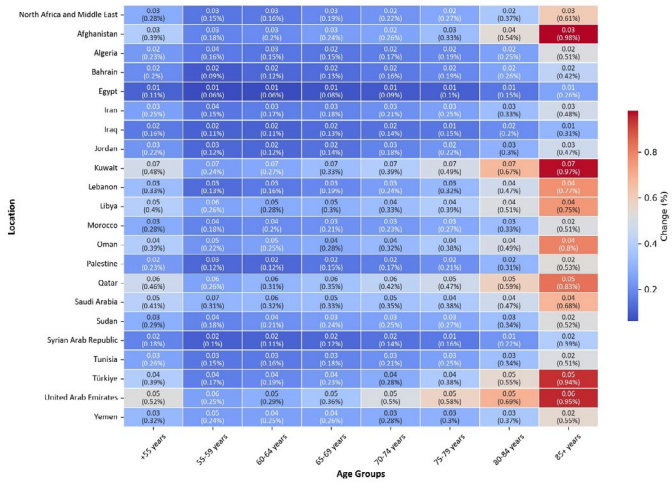
Objective: Low bone mineral density (LBMD) is a significant risk factor for morbidity and mortality, particularly in older adults. This study estimates the burden of LBMD and evaluates potential life expectancy gains from eliminating this risk to guide policymaking in the North Africa and Middle East (NAME) region.

Methods: The Global Burden of Disease Study 2021 was used as the data source for death, years of life lost (YLL), years lived with disability (YLD), and disability-adjusted life years (DALYs) attributable to LBMD from 1990 to 2021. The burden attributable to LBMD was incorporated in the population-attributable fraction for the estimation of deaths and DALYs and was presented with 95% uncertainty intervals (95% UIs). The effect of LBMD on life expectancy was estimated via cause-deleted life tables, which were computed hypothetically by considering the years of life that would be saved by lowering the levels of LBMD to the theoretical minimum risk exposure level (TMREL) (1).

Results: From 1990 to 2021, DALYs attributable to LBMD increased from 390.8 thousand (95% UI: 328.4 to 449.0) to 798.5 thousand (661.0 to 940.0). Deaths attributable to LBMD rose from 9,106.7 (7,683.8 to 10,245.2) to 17,730.7 (14,883.1 to 20,211.1). However, age-standardized rates per 100,000 population decreased for DALYs (from 226.2 [189.4 to 261.2] to 167.6 [139.0 to 197.2]) and deaths (from 6.4 [5.4 to 7.4] to 4.5 [3.8 to 5.1]). The YLD age-standardized rate per 100,000 remained stable at approximately 80 between 1990 and 2021, whereas the YLL rate declined from 141.8 to 93.8. This resulted in an increase in the YLD-to-YLL ratio from 0.6 to 0.8. Life expectancy gains from removing LBMD as a risk factor were minimal across all countries and age groups, adding approximately 0.03 years overall, with percentage increases remaining below 1% even in older populations (Figure 1).

Conclusions: The rising YLD-to-YLL ratio and minimal gains in life expectancy from eliminating LBMD highlight the effectiveness of interventions in reducing mortality. However, the remaining burden is predominantly related to morbidity. Policymakers should prioritize strategies aimed at reducing the morbidity associated with LBMD rather than focusing solely on mortality reduction.

Figure 1. Changes in life expectancy by age in North Africa and Middle East region and its countries in 2021 if low bone mineral density (LBMD) had been lowered to the theoretical minimum risk exposure levels.



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ASSOCIATION OF FRACTURES DUE TO FALLS WITH SOCIO-DEMOGRAPHIC INDEX (SDI) AT THE GLOBAL LEVEL

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Objective: Bone fractures represent a significant global public health concern due to their associated disability. Falls are the leading cause of fractures. Analyzing the burden of fractures and their subtypes attributable to falls in relation to the socio-demographic index (SDI) provides valuable insights for policymakers to design targeted interventions.

Methods: Data on the prevalence, incidence, and years lived with disability (YLDs) of fractures and their subtypes due to falls, as well as SDI values for different regions, were extracted from the Global Burden of Disease Study (GBD) 2021 data repository. Results were reported with 95% uncertainty intervals (95% UIs). Locally estimated scatterplot smoothing (LOESS) regression was employed to evaluate the association between SDI and fracture

burden metrics.

Results: Between 1990 and 2021, the absolute number of fractures due to falls increased significantly: incidence rose from 67.2 million (95% UI: 57.1–79.6) to 100.5 million (87.9–114.3), prevalence grew from 158.2 million (138.0–178.9) to 275.8 million (243.6–307.3), and YLDs rose from 8.9 million (6.0–12.5) to 15.3 million (10.3–21.6). However, age-standardized rates per 100,000 population showed a declining trend: incidence decreased by 7.0%, prevalence by 9.8%, and YLDs by 12.1%. Fracture patterns remained consistent across years and locations (Figure 1). The most prevalent and disabling fractures due to falls were those of the patella, tibia, or femur (approximately 66% and 70%, respectively), followed by hip fractures (16% and 10%). However, the proportion of other fractures, particularly fractures of the radius and/or ulna, increased for incidence, reaching approximately 21%. The burden of fractures due to fall—incidence, prevalence, and YLDs—was strongly associated with SDI, with a significant positive correlation (r = 0.75) (Figure 2). Prevalence exhibited the strongest association with SDI, with a coefficient of 9060.9.

Conclusions: While global age-standardized rates of fracture incidence, prevalence, and YLDs due to falls declined slightly from 1990 to 2021, absolute numbers increased substantially, underscoring the growing burden. The high prevalence and YLDs associated with fractures of the patella, tibia, or femur and hip are particularly concerning due to their severe consequences, necessitating targeted preventive measures. The positive association between SDI and fracture burden highlights the need for policymakers in high-SDI regions to prioritize strategies aimed at reducing falls and their impact.

Figure 1. The proportion of different subtypes of fracture due to fall in different location in 1990 and 2021.

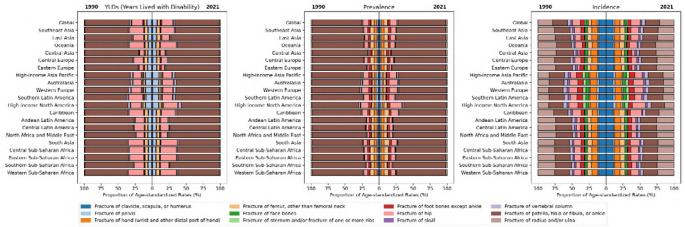
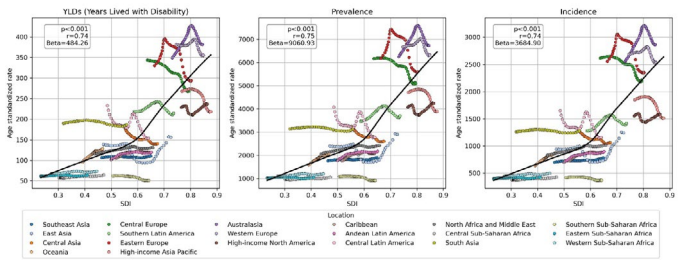


Figure 2. The association of different burden measures of fracture due to fall with socio-demographic index (SDI).



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SERUM CHOLESTEROL AS A MODIFIABLE CARDIOVASCULAR RISK FACTOR AMONGST PATIENTS ON ROMOSOZUMAB TREATMENT

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Introduction: Romosozumab is a potent and effective anabolic treatment for patients at very high fracture risk. Cardiovascular(CV) safety concerns were raised from ARCH trial in the Romosozumab group when compared to the Alendronate group. Osteoporosis patients are elderly and many have associated cardiovascular risk factors some of which are modifiable thereby having potential to modify romosozumab potential CV side effects

Objective: the aim of study was to measure lipid profile of patients who were started on Romosozumab and to modify elevated levels of high cholesterol >4 mmol/L)and LDL (>1.8 mmol/L).

*Methods:*Setting-single-centre specialist osteoporosis clinic in a teaching hospital in UK) Subjects- high fracture risk patients who have qualified for Romosozumab. Intervention- Serum lipid profile was measured before and at the end of one year romosozumab treatment and patients with elevated levels were advised atorvastatin 20 mg or 40 mg(if already on statin) /day via letter to GP.

Results: 27 patients have not finished injromosozumab course. Out of 20patients completed Romosozumab, average age of 69years (range 65 to 80).All were postmenopausal females. The average baseline 5-year fracture risk was 18.1% ± 8.6% for MOP fractures and 8.8 ± 5.4% for hip fractures. The baseline 5-year cardiovascular risk (QRISK-3)was7.8 ± 4%. The most common cardiovascular risk factors were hypertension (35%), history of smoking (4%), current smoking (2%), diabetes mellitus Type 2 (5%).Serum total cholesterol >4 mmol/L (range 4.1 to 8.2) in 19/20 and LDL > 1.8 mmol/L (range 2 to 5.2)in 17/20 patients. 19 patients advised cholesterol lowering drug out of which 2 had intolerance, others completed 12 months. At the end of one year romosozumab treatment, the serum cholesterol and LDL levels were significantly lower –mean TC 4.8 and LDL was 1.1. No patient suffered any adverse CV event during study period.

Conclusion: Patients suitable for romosozumab had a high fracture risk but also have cardiovascular risk factors. Given the substantial benefits of romozosumab on fracture risk reduction, patient's CV risk status can be easily modifiable thereby reducing any suspected CV side effect of romosozumab. Prescribing physicians should assess and treat modifiable CV risk factors such as hypertension, smoking, diabetes, obesity and hypercholesterolaemia and not exclude potential patients who could have huge fracture risk reduction benefits.

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REAL WORLD EXPERIENCE OF ROMOSOZUMAB IN A TERTIARY SPECIALIST CLINIC

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Objective: This study aimed to investigate the real-world experience of 12 months of romosozumab treatment on acceptability, tolerability, BMD increase and identify factors that predict the rate of BMD increase after 12 months of romosozumab treatment.

Methods:setting-tertiary centre clinic. We prospectively investigated 52 patients commenced on 12-month romosozumab treatment for osteoporosis with a high risk of fractures at a hospital in UK. Data on BMD, fragility fracture before and during the treatment was collected. Reasons for any discontinuation, patient feedback and nursing staff experience was recorded.

Results –average age 64 yrs (Range 60 to 80 yrs) All females. Amongst 52 patients with high fracture risk eligible and offered Romosozumab treatment, 1 refused, 27 still ongoing 20 completed one year course. 155 high risk patients could not be started on treatment as males(12) (not licenced), high QRISK score(55) patient refusal (3) ,patients with frailty/comorbidities/cognitive impairment(85), fracture more than 2 yrs before (delayed presentation to clinic)(40).
34 patients were naïve and not received antiresorptive treatment before. After 1 year of treatment, the lumbar spine BMD increased by 14.6%, and femoral neck BMD increased by 5.1%. There were superior BMD gains when romosozumab is given to treatment-naïve patients before antiresorptive drugs. Patients with lower BMD before receiving romosozumab were more likely to have increased BMD with romosozumab treatment. No patient suffered a fragility fracture during treatment. The drug was well tolerated by all except one patient discontinued after 3 doses due to rash. Patient and nursing feedback was very good.
Conclusion, our real world study demonstrated the effectiveness,-acceptability and safety of the 12-month romosozumab treatment for osteoporosis on both hip and spine BMD in patients at high risk of fractures which supports results of randomised trials. Majority of patients who were offered Romosozumab accepted advice. A large percentage of high fracture risk patients are being denied the benefits of this potent osteoporosis drug due to suspected CV safety concerns and strict NICE criteria. These findings support the CV safety and tolerability of romosozumab in eligible patients. Anabolic-first approach is needed for maximum benefits and strategies are needed for early identification and referral of this cohort.

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HOW COMMON IS VITAMIN D DEFICIENCY IN HIGH RISK POPULATION?

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Objectives: Vitamin D deficiency is defined as a risk factor for osteoporotic fractures but the prevalence in the subgroup of frail older hospitalized patients is not clear. We sought to investigate the prevalence and predictors of vitamin D deficiency in frail older hospitalized patients.
The aim of this study was to evaluate serum levels of 25-hydroxyvitamin D (25OHD) in high fracture risk hospitalised patients with or without fragility fractures
Methods: we measured the serum 25OHD levels of 45 patients admitted with vertebral fractures, 87 patients with hip fractures, 35 patients with Parkinsons disease , 220 patients with frailty to evaluate the prevalence of vitamin D insufficiency. Those who were receiving antiosteoporosis therapy including vitamin D were excluded. Serum 25 (OH)D concentrations < 29.9 nmol/L and between 30 and 49.99 nmol/L were classified as deficient and insufficient, respectively, whereas concentrations ≥50 nmol/L were considered as desirable. A stepwise binary logistic regression model was performed to assess the simultaneous effects of age, gender and comorbidities on the prevalence of low vitamin D concentration.
Results: Mean age of the cohort was 83.6±8.0 years (72% females) only 5% had desirable serum concentrations ≥50 nmol/L , 25% had concentrations in insufficiency range 70% were in deficiency range. Vitamin D deficiency and insufficiency was prevalent in high fracture risk patients (71%) and more common in female patients (78%). Univariate logistic regression analysis showed age, gender, bone mass index (BMI), femoral neck BMD, calcium, and vitamin D levels were significantly different between patients with fragility fractures and the control group. 25OHD levels was not significantly associated with their underlying diseases, such as diabetes mellitus, hypertension or stage of chronic kidney disease but were significantly lower in patients with recurrent falls and frailty. The other markers, albumin, alkaline phosphatase, PTH were not significantly associated with 25OHD levels.
Conclusion: In the group of frail older hospitalized patients without previous vitamin D supplementation, the prevalence of inadequate vitamin D concentrations is extremely high. Vitamin D insufficiency is likely to be an important risk factor for fragility fractures as well as patients with recurrent falls and frailty in both men and women but more pronounced in females. Therefore, usefulness of the routine measurement of vitamin D status before initiating of supplementation appears to be questionable in this patient group. Further studies to evaluate possible routine supplementation of Vitamin D (simple and cheap intervention) to derive its benefits in this high risk group is needed.

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WHAT IS KNOWLEDGE ATTITUDE AND PRACTICE TOWARDS OSTEOPOROSIS ?

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Objective: To identify the level of knowledge, attitude, and practice (KAP) toward osteoporosis amongst nurses and medical students at a teaching hospital in United Kingdom.
Methods: A cross-sectional design was adopted in this study. A convenience sample of 150 trained nurses working in medical and orthopaedic wards and 150 medical students (Year 4 and 5) were given a self administered questionnaire. The assessment tool used in the current study contained 35 items, measuring KAP amongst a cohort of teaching hospital nurses and students toward osteoporosis. Part 1-demographic details. Part 2 –knowledge amongst participants. Part 3 attitudes towards osteoporosis Part 4- their practice. The correlation Pearson test and regression test were used to analyze data using Statistical Package for Social Sciences.
Results: The total KAP scores were 25, 38, and 20 respectively amongst nurses and 45, 58 and 65 amongst medical students. These results revealed that nurses have a moderate level of KAP toward osteoporosis with better scores amongst medical students.
Conclusions: nurses who regularly deal with high risk osteoporosis patients showed a moderate KAP and had major gaps on knowledge, their attitudes and clinical practice towards osteoporosis. Their training and education needs to be improved as an effective step to reducing the growing incidence and impact of osteoporosis. Medical students had higher scores possibly due to better training programs. The lack of KAP can have a serious and growing impact on the health sector and patients' health in terms of cost, healthcare resources, and social impact. Nurses and medical students can play a valuable role in educating patients on bone fractures/osteoporosis, its risks, and prevention, as well as in helping them with nutrition, drug and lifestyle recommendations.

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OSTEOPOROSIS AS A MANIFESTATION OF LYSINURIC PROTEIN INTOLERANCE

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Objective: To present a case of severe osteoporosis in a child with lysinuric protein intolerance. Lysinuric protein intolerance (LPI, OMIM: 222700) is a rare autosomal recessive disorder caused by mutations in the SLC7A7 gene. The pathogenesis is based on impaired transport of cationic amino acids (lysine, arginine, ornithine) in the intestine and kidneys. This disease does not show a correlation between phenotype and genotype and is highly variable in its clinical manifestations.
Case report: We present a 17-year-old girl who was followed up in our clinic for 5 years for idiopathic osteoporosis. She was first admitted to us at the age of 12 years with back pain that developed after a 3-month course of prednisolone for the treatment of unspecified recurrent encephalopathy. The patient's medical history included 2 left femur fractures (at 1 year 8 months and at 2 years), chronic pyelonephritis, hepatosplenomegaly, short stature, normochromic anemia, elevated ESR, elevated ferritin and LDH levels, and an aversion to protein-rich foods. Blood amino acid analysis did not reveal any diagnostically significant abnormalities. MRI showed multiple compression fractures of the thoracic and lumbar vertebrae. Dual-energy X-ray absorptiometry revealed low bone mineral density (BMD) in the lumbar spine (Z-score -4.7 SD) and the whole body excluding the head (Z-score -2.8 SD). The patient took cholecalciferol, alfacalcidol and calcium carbonate, but without significant changes. She was prescribed bisphosphonates (pamidronic acid) at the age of 15. During treatment with bisphosphonates, a significant increase in BMD was observed in the lumbar spine (Z-score -2.4 SD) and the whole body excluding the head (Z-score -2.4 SD) and a decrease in the degree of vertebral deformation in the thoracic and lumbar spine. At the age of 17, whole exome sequencing, performed to identify the cause of osteoporosis, revealed a heterozygous mutation in the SLC7A7 gene. Thus, it was not until the age of 17 that LPI was diagnosed.
Conclusion: The presented case highlights the importance of maintaining a high index of suspicion for LPI in patients with unexplained fractures and idiopathic osteoporosis and demonstrates the utility of whole exome sequencing for the diagnosis of rare diseases with unusual presentations, where early intervention can significantly impact the clinical course and outcome.

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THE PREVALENCE OF OSTEOPOROSIS IN BOSNIAN PATIENTS WITH RHEUMATOID ARTHRITIS

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Objective: The aim of this study was to determine the frequency of osteoporosis and to analyze the risk factors in rheumatoid arthritis (RA) patients.
Matherial and Methods: A total of 126 patients with rheumatoid arthritis, treated between January 2024 to October 2024 at the Clinic for heart, blood vessels and rheumatic diseases of the University Clinical Center in Sarajevo with bone mineral density (BMD) results were included in this study. The patients were divided into two groups according to bone mineral densitometry (BMD) status, osteoporotic and non osteoporotic. The data were collected from medical records of each patients and association between osteoporosis and related risk factors were recorders. The differences were tested using chi-square and Mann-Whitney

tests. The level of statistical significance was set at p<0,05.
Results: Of the 126 patients with RA, 117 women (92,86%) and 6 men (7,14%), 47 patients (37,29%) were in the osteoporotic group (T score ≤-2.5 SD in L2-L4 in the lumbar spine or in the femoral neck). The mean age of the patients was 63,45±9,52 years and the patients were significantly older in the osteoporotic group 64,12±10,10, compared to patients without osteoporosis 53,21±8,51 (p<0,01). The average BMI of the patients with osteoporosis was significantly lower (27,84±7,50 kg/m²) compared to patients without osteoporosis (32,45±4,30 kg/m²) (p<0,01). RA patients with osteoporosis had a higher frequency of fractures that those in other group, especially fractures of the femur (p<0,01).
Conclusion: A large percentage of our patients with rheumatoid arthritis had osteoporosis. Old age, low BMI, menopause were the main risk factors for osteoporosis.
Keywords: osteoporosis, rheumatoid arthritis, prevalence, risk factors

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VITAMIN D STATUS IN BOSNIAN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS

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Objective: The aim of this study was to investigate the serum vitamin D levels in Bosnian postmenopausal women with diagnosed osteoporosis, and the associations of serum 25(OH)D level with bone mineral density (BMD).
Material and Methods: Assessment of 25-hydroxyvitamin D (25(OH)D) was performed in 132 Bosnian postmenopausal women with a diagnosis of postmenopausal osteoporosis. Bone mineral density (BMD) measured on the lumbar spine (L1-L4), femoral neck were obtained by dual-energy X-ray absorptiometry (DXA). The differences were tested using chi-square i Pearson correlation coefficient. The level of statistical significance was set at p<0,05.
Results: Among 132 examined postmenopausal women aged > or =50 years for vitamin D level, deficiency of vitamin D was found in 116 (87,88%) of patients. Average 25(OH)D serum concentrations was 44,25 nmol/L. Our results has shown the deficiency of vitamin D in 87,88% of the examinees with postmenopausal osteoporosis, and positive correlation of the level of 25 (OH) D and bone mineral density (BMD) or T score on lumbar spine (L1-L4) (p<0,05) and a significantly lower initial concentration of 25 (OH) D with the examined with prior bone fractures (36,92±12,22) opposed to those without fractures (53,82±18,15) (p<0,01). Patients with diagnosed postmenopausal osteoporosis have reduced levels of vitamin D, which is an important factor in reduced bone density and bone fractures.
Conclusions: This study showed the vitamin D deficiency in Bosnian postmenopausal women with osteoporosis and the relationships between vitamin D and BMD. The results contribute to a more comprehensive understanding of how vitamin D may impact bone health.
Keywords: osteoporosis, vitamin D status, postmenopausal women, bone mineral density

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RETROSPECTIVE COHORT STUDY OF INTRAOSSEOUS VANCOMYCIN FOR SURGICAL TREATMENT OF NATIVE SEPTIC ARTHRITIS

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Background
The use of intraosseous (IO) vancomycin in arthroplasty has been a recent topic with promising results in primary hip and knee replacement surgery. It has also been established in recent literature to yield increased local drug perfusion and penetration for revision surgeries in lowering the risk of periprosthetic joint infection (PJI). We utilize intraosseous vancomycin administration for patients that are presented with native septic arthritis and analyze the safety and outcomes compared to a conventional treatment protocol.
Methods
We performed a retrospective comparative study on native septic arthritis from either direct joint inoculation or hematogenous infection. A diagnosis of septic arthritis was reached with a synovial WBC cell-count greater than 50,000 cells/mm3. We evaluated preoperative and postoperative serum lab, organism, and antibiotics profile. All patients underwent arthrotomy of the infected joint. The control group (n=30) underwent radical debridement followed by rigorous irrigation. The IO group (n=15) received additional IO vancomycin. Systemic treatment of organism-specific intravenous antibiotics was given post-operatively for a minimum of two weeks as according to treatment guidelines.
Results
Comparative analysis was performed for the matched cohort. There was a trend towards earlier decrease of CRP and ESR to no statistical difference. The prevalence of adverse effect was similar between the two groups, while the development of AKI was lower in the IO group, but without statistical significance.
Conclusions
Use of IO vancomycin in native septic arthritis is a novel surgical strategy with scarce literary documentation. We found the outcome of IO vancomycin to be promising and with safe results. A larger cohort study via this technique may yield statistical significance in the increased potency of IO organism eradication properties.

P200

SCREENING FOR SARCOPENIA IN OSTEOPOROTIC AND OSTEOPENIC POSTMENOPAUSAL WOMEN USING RECTUS FEMORIS ULTRASONOGRAPHY AND BIOIMPEDANCE

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Objectives: Osteosarcopenia is characterized by decreased muscle mass and function in patients with low bone mineral density. When osteoporosis and sarcopenia are present concomitantly, they form a "hazardous duet" leading to increased frailty, fractures, and mortality (1). Recent studies have aimed to find a readily available, low cost and efficient method to evaluate muscle mass (2). Our study aims to investigate how muscular ultrasound parameters compare to bioimpedance in postmenopausal women with osteopenia or osteoporosis.

Materials and methods: We evaluated muscle function and quantity in 40 osteoporotic and 22 osteopenic women presenting to the Endocrinology Department of Targu Mures County Hospital. Handgrip strength (HGS) and gait speed (GS) were used to evaluate muscle strength and function with cut-off values of HGS <18kg, GS <0.8m/s. We estimated appendicular skeletal muscle mass (ASMM) from bioimpedance using the equation by Kyle et al (3). Rectus femoris muscle thickness (MT), cross-sectional area (CSA), and pennation angle were measured using ultrasound and compared to estimated ASMM and ASM/height^2 using a cut-off value of 5.5kg/m^2 based on EWGSOP2 criteria.

Results: 62 women were included in our study with a mean age of 66.5 ±7.3. 25.8% of women had low muscle strength and 7.8% had sarcopenia. Osteoporotic women had significantly lower rectus femoris CSA (4.7 cm^2 vs. 5.6 cm^2, p=0.02) and MT (1.41 cm vs 1.56 cm, p=0.016) compared to osteopenic women, also after adjusting for BMI. Women with low HGS had lower rectus femoris pennation angle (10.3° vs 11.6°, p=0.01). MT and CSA were moderately correlated to estimated ASMM.

Conclusion: The findings of our study suggest that assessing muscle quantity with ultrasound may effectively indicate overall muscle mass. Sarcopenia is often underdiagnosed, significantly affecting the quality of life of older adults. Incorporating muscle ultrasound into routine clinical practice could play a pivotal role in earlier detection and improving outcomes in sarcopenia.

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P201

PREDICTIVE SCORING SYSTEM FOR INDEPENDENT WALKING DISABILITY AT THREE MONTHS AFTER FRAGILITY HIP FRACTURE SURGERY: A MULTICENTER STUDY

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Objectives: Loss of independent walking ability after hip fractures in older adults increases morbidity and mortality. This study developed a scoring system to predict the risk of independent walking disability at 3 months postoperatively in patients aged ≥60 years with fragility hip fractures.

Materials and Methods: A prospective observational cohort study analyzed 767 patients aged ≥60 years with intertrochanteric or femoral neck fractures treated at eight hospitals in 2024. Multivariable logistic regression identified predictors, which were converted into a 17-point scoring system stratifying patients into low-, moderate-, and high-risk groups. Bootstrap internal validation assessed predictive performance.

Results: Among participants, 15.5% (119/767) had independent walking disability at 3 months. Nine predictors were identified, including age, Charlson Comorbidity Index, pre-fracture walking status, ASA classification, serum albumin, Barthel Index, operative type, postoperative complications, and hospital stay (Table 1). The scoring system achieved 81% accuracy (AuROC=0.8124). Patients scoring 0-5 (low risk) had a 1.8% risk of walking disability, suggesting routine follow-up; scores of 6-15 (moderate risk) indicated 19.5% risk, requiring home visits; and scores of 16-17 (high risk) showed a 63.6% risk, recommending home ward care.

Conclusions: This scoring system enables accurate risk stratification for walking disability, guiding personalized rehabilitation and targeted interventions, particularly for high-risk patients needing home ward care.

Table 1. The clinical predictors and scoring system

Predictors	OR	95% CI	*p*-value	Coefficient	Score
Age (years)					
<80	1.00	reference	-	0	0
≥80	2.29	1.53-3.44	<0.001	0.3267	1
Charlson Comorbidity Index					
<5	1.00	reference	-	0	0

≥5	2.71	1.82-4.04	<0.001	0.3565	1
Pre-fracture walking status					
No gait aids	1.00	reference	-	0	0
With gait aids	2.19	1.47-3.27	<0.001	0.4416	1
Preoperative serum albumin level (mg/dL)					
≥3.5	1.00	reference	-	0	0
<3.5	2.72	1.82-4.05	<0.001	0.5147	2
ASA classification status					
I-II	1.00	reference	-	0	0
III-V	3.96	2.17-7.20	<0.001	0.9514	3
Operative type					
Arthroplasty	1.00	reference	-	0	0
Internal fixation	1.99	1.24-3.21	<0.001	0.6224	2
Postoperative complications					
No	1.00	reference	-		0
Yes	2.26	1.48-3.35	<0.001	0.3586	1
Barthel Index					
≥12	1.00	reference	-		0
<12	7.75	4.75-12.65	<0.001	1.6789	5
Length of hospital stay (days)					
≤7	1.00	reference	-	0	0
>7	2.37	1.59-3.57	<0.001	0.4370	1

P202

EFFECTS OF DISCONTINUING DIFFERENT ANTIRESORPTIVE REGIMENS ON MEDICATION-RELATED OSTEONECROSIS OF THE JAW IN PATIENTS UNDERGOING DENTAL PROCEDURES: A SYSTEMATIC REVIEW AND NETWORK META-ANALYSIS

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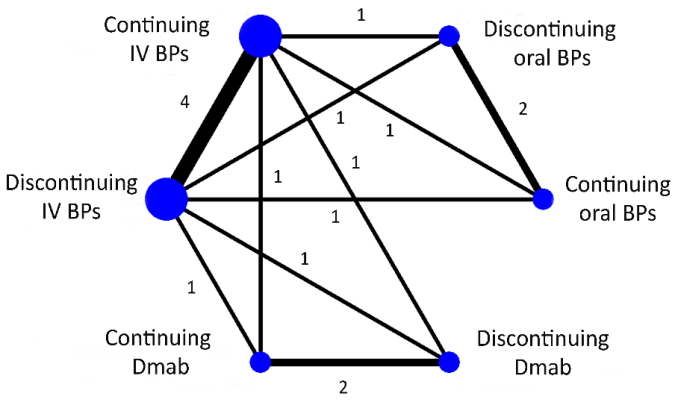
Objectives: Controversy exists on whether a drug holiday is necessary for patients on antiresorptive medication for osteoporosis or bone metastasis and undergoing dental procedures to lower the risk of medication-related osteonecrosis of the jaw (MRONJ). This study evaluated the effects of discontinuing different antiresorptive regimens on MRONJ in these patients.

Material and Methods: Publications from PubMed, EMBASE, Cochrane Library, and EBSCO Open Dissemination were searched from inception to September 2023, following PRISMA guidelines, and the review was registered in PROSPERO. Eligibility criteria included clinical studies on the effects of continued and discontinued antiresorptive medications for osteoporosis or bone metastasis in patients undergoing dental procedures. The involved antiresorptive agents were oral bisphosphonates (BPs), intravenous (IV) BPs, and denosumab (Dmab). The primary outcome was the occurrence of MRONJ assessed by clinical and radiographic findings. Quality assessment was investigated using the risk of bias in non-randomized studies of interventions (ROBINS-I) tool for the non-randomized studies and the risk of bias in randomized trials (RoB 2) tool for the randomized controlled trials (RCTs). Risk ratios (RRs) with 95% confidence interval (CI) were estimated using a random-effects model.

Results: Of the 2,590 records identified, 6 studies (n=717) were included (see Figure for the network geometry). Quality assessment evaluated by risk of bias was moderate in 4 studies and low in 2 studies. Discontinued use of oral BPs had a lower MRONJ risk than discontinuation of IV BPs (RR=0.05; 95% CI 0.00-0.83) and continuation of IV BPs (RR=0.03; 95% CI 0.00-0.46). Continuing oral BPs also resulted in a lower MRONJ risk compared to both discontinuation and continuation of IV BPs, with RR=0.04 (95% CI 0.00-0.67) and RR=0.03 (95% CI 0.00-0.37), respectively. No significant difference was found between continuation and discontinuation of oral BPs, along with other comparisons.

Conclusions: A drug holiday may not be necessary before dental procedures for oral BPs. Temporary discontinuation of IV BPs or Dmab is also unlikely to reduce MRONJ risk compared to continued medication.



P203

THE NEW SHARED GENETIC CONTRIBUTION OF OBESITY AND OSTEOPOROSIS

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Background: The relationship between obesity and osteoporosis is complex and inconsistent. Genetic factors may influence the effects of obesity on the odds of incident osteoporosis.
Objective: We aim to evaluate if a common genetic factor causes obesity and osteoporosis that can be assessed through blood samples.
Material and Methods: We searched the gene expression omni (GEO) for datasets evaluating the gene expression of obese *vs.* normal weight and individuals with high peak bone mass (PBM), an important determinant of osteoporosis, versus subjects with low PBM. The datasets were analyzed using affy and limma packages in R. The up-regulated differentially expressed genes (DEGS) in each dataset were retrieved and the community between three lists was obtained through a Venn diagram. The shared genes were enriched in Enrichr and Enrichr-KG.
Results: Two genes named CCNL1 and MALAT1 were upregulated in all datasets. These genes are involved in TNF-alpha Signaling via NF-kB according to MSigDB Hallmark 2020. Other pathways enriched significantly were Increased Brain Apoptosis (MP:0014178), Brain Inflammation (MP:0001847), and Abnormal Nervous System Physiology (MP:0003633). Also, CCNL1 which is a new genetic factor that is shown in both osteoporosis and obesity is related to the regulation of transcription by RNA polymerase II as its biological process (GO:0006357) and is regulated by transcription factors like HES7, ZNF75A, HOXA2, ZNF304 and MAPK9 from ARCHS4 all co-expressed with kinases.
Conclusion: Although some studies indicated that obesity protects against osteoporosis others illustrated divergent results as an association between obesity and low body mass density (BMD). In this study, we showed that obesity and high PBM have shared underlying genetic identifiers as overexpression of CCNL1 and MALAT1 have been detected in both conditions which might be the reason for the greater risk of fracture in obese subjects. CCNL1 and MALAT1 might mimic the role of leptin in decreased bone formation through the central nervous system in obese patients.

P204

RELATIONSHIP BETWEEN BODY MASS INDEX AND BONE MINERAL DENSITY AT LUMBAR SPINE AND FEMORAL NECK IN BOSNIAN POSTMENOPAUSAL WOMEN

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Objective: This study aims to investigate the relationship between body mass index (BMI) and bone mineral density (BMD) at different skeletal sites in Bosnian postmenopausal women.
Material and Methods: A total of 200 postmenopausal women from Bosnia and Herzegovina (BiH) participated in the study. The participants were divided into two study groups (those with osteoporosis at the lumbar spine and those with osteoporosis at the hip) and two control groups (those without osteoporosis at the lumbar spine and those without osteoporosis at the hip). BMD was measured at the lumbar spine and proximal femur using Dual-Energy X-ray Absorptiometry (DXA). BMI was calculated by dividing weight (in kilograms) by height squared (in meters) (kg/m²).
Results: There was no statistically significant difference in age between the groups. However, a significant difference in BMI was observed between the study and control groups. The average BMI was significantly lower in women with osteoporosis at the lumbar spine (21.48±0.73 kg/m²) compared to those without osteoporosis at the lumbar spine (29.69±1.47 kg/m²), $p<0.01$. Similarly, women with osteoporosis at the hip had a significantly lower average BMI (21.51±0.79 kg/m²) than those without osteoporosis at the hip (29.14±1.87 kg/m²), $p<0.01$. BMI was positively correlated with BMD at the lumbar spine ($p<0.01$; $r=0.792$) and femoral neck ($p<0.01$; $r=0.929$).
Conclusions: The findings of this study indicate that a lower BMI is associated with an increased risk of osteoporosis at both the lumbar spine and the hip in postmenopausal women living in BiH. Conversely, a higher BMI is linked to increased BMD in this population.
Keywords: BMI, BMD, Bosnian postmenopausal women

P205

FREQUENCY OF PERIPROSTHETIC FRACTURES IN TOTAL HIP ARTHROPLASTY BETWEEN PATIENTS WITH RHEUMATOID ARTHRITIS AND OSTEOARTHRITIS

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Surgical treatment of patients with rheumatoid arthritis (RA) is associated with an increased risk of complications due to the presence of an inflammatory process, prolonged intake of glucocorticoids (GC), disease-modifying and genetically engineered biological drugs, reduced physical activity, functional disorders and severe osteoporosis. All this contributes to an increased risk of intraoperative complications, including periprosthetic fractures.
Objective: to conduct a comparative analysis of periprosthetic fractures, which included intraoperative fractures of the large and small trochanter, as well as the acetabulum, during total hip arthroplasty (THA) in patients with RA and osteoarthritis (OA).
Material and methods: 1173 hip replacement operations were performed in patients with RA and OA in the period from 2004 to 2023 (OA – 709, RA – 484).
Results: A total of 41 (3.49%) periprosthetic fractures were diagnosed during THA. Of these:
- 23 (4.96%) fractures occurred in patients with RA;
- 18 (2.54%) in patients with OA.
In most cases, osteosynthesis with intraosseous sutures, circular sutures with wire or plate was performed for the treatment of periprosthetic fractures (61.8%), and Wagner's long revision leg was also used. Osteosynthesis was performed more often in patients with OA (66.7%), less often in patients with RA (43.5%).
Statistical analysis of the data revealed a significantly higher number of complications in the group of RA patients ($p=0.0288$). Significant differences were also obtained in the analysis of each type of complications ($p<0.05$).
Conclusion: obtained results confirmed that the risk of periprosthetic fractures was 2 times higher in RA patients than in patients with OA. Therefore, these patients require a special approach, which includes in the competent medical perioperative treatment of osteoporosis and careful handling of bone and surrounding soft tissues during the operation.

P206

CORRELATION OF POSTMENOPAUSAL OSTEOPOROSIS WITH BMD, SKIN COLOR AND LEVEL OF EDUCATION

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Objectives: the study aimed to assess the correlation of postmenopausal osteoporosis with body mass index, level of education, and skin color in Albanian women.
Material and methods: it was a cross-sectional study with a total of 4115 Albanian women. All subjects are asked about their level of education, skin color, and body mass index calculated for all women enrolled in the study. Bone mineral density was measured using Achilles ultrasound.
Results: Overall, 299 (6.2%) postmenopausal women were diagnosed with osteoporosis and 793 (16.6%) with osteopenia. By using Kendal's correlation coefficient we found a negative correlation between osteoporosis and level of education ($r=-0.101$, $p<0.001$) and a positive correlation between osteoporosis with white skin color ($r=0.0032$, $p<0.027$). We found a negative correlation between osteoporosis and body mass index ($r=-0.0033$, $p<0.009$) also.
Conclusions: estrogen decrease plays an important role in developing osteoporosis in postmenopausal women. There is a correlation between postmenopausal osteoporosis and white skin color, low body mass index, and low levels of education.

P207

OSTEOPOROSIS AND EARLY MENOPAUSE

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Objectives: The study aimed to assess the correlation between early menopause, before age 45, and osteoporosis.
Material and methods: It was a cross-sectional prospective study with 4115 Albanian women participation. All subjects were asked about the age of menopause and were measured for bone mineral density, using Achilles ultrasound device.
Results: Overall, 6.2% of women were diagnosed with osteoporosis. 36.1% of total menopausal women have had menopause before age 45. The regression analysis model demonstrated that postmenopausal women had 69% more chances to have osteoporosis versus the others (OD=1.69; 95%CI=1.45-1.77). A significant statistical correlation was found between early menopause and osteoporosis (OR=1.83, 95%CI=1.02-4.25).
Conclusions: This study provides useful evidence of correlations between osteoporosis and early menopause.

P208

DETERIORATION OF BONE QUALITY PARAMETERS AFTER CYTOTOXIC TREATMENT WITH TAXANES

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Chemotherapy-induced osteoporosis is an iatrogenic side effect of many antineoplastic treatments. Chemotherapy-driven estrogen loss is postulated to drive bone loss, but significant data suggests the existence of an estrogen-independent mechanism. Direct negative effects of cytotoxic treatment (e.g. Docetaxel) on bone have been reported anecdotally, but little information is available in the literature.

The aim of the present study was to investigate the effects of widely used chemotherapy on bone after simulated osteoporosis. M&M: 56 SD rats were divided into three groups. All animals underwent sham ovariectomy (sham-ovx) or ovariectomy (ovx) at 6 months of age. The sham group and one ovx group received placebo therapy, the other ovx group received docetaxel (10mg/kg bw) intraperitoneally for 6 cycles with an interval of 3 weeks. A DXA measurement of L5 (Hologic QDR 4500+, animal software) was performed before the first cycle, 15 weeks after ovx and 10 weeks after the last cycle of chemotherapy. 10 weeks after the last cycle, the animals were killed. The spinal column and both femora were obtained. PQCT and µ-Scope (Stratec, Germany) of the proximal femur a, µCT of LWK 5 (Skyscan- Bruker, USA)

Results

DXA (mg/cm²)	Normal bone Sham/Placebo	Osteoporotic bone OVX/Placebo	Osteoporosis + Chemotherapy OVX/TAX	Difference % OVX/Pla vs. OVX/TAX	p-value
Pre Chemo	0,244	0,193	0,204	+ 5,4	ns
OVX10 weeks post Chemo	0,242	0,200	0,180	-10	< 0,05
µCT					
BV/TV	46,44	27,91	24,42	-12,5	<0,05
Tb.Sp.	0,239	0,309	0,338	+ 8,6	ns
Tb.N.	3,926	3,109	2,82	-9,3	ns
µCT BMD L5 g/cm³	3,59	2,73	1,99	-27,1	<0,05
pQCT FN trab. BMD µg/cm³	1200,8	1011,3	902,1	-9,9	<0,05

Discussion: Based on the data collected in this study using various methods of bone quality assessment, it is clear that chemotherapy-induced osteoporosis cannot be explained solely by the negative effect on the ovaries. Compared to normal bone, a significant loss of bone mass and trabecular architecture has been shown after OVX, which has already been shown before. If estrogen-deficient osteoporosis is already present, as in the case of simulated osteoporosis caused by OVX, the cytotoxic agent docetaxel can lead to a further loss of bone mass and architecture. A direct negative effect on the bone must therefore be assumed.

P209

FREQUENCY AND DETERMINANTS OF SUBCLINICAL ATHEROSCLEROSIS IN GOUT

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Objective. The study aimed to reveal the presence of subclinical carotid atherosclerosis in a group of gout patients by US examination and to explore potential correlations with various disease-related variables.

Material and methods. This observational, prospective study included 65 consecutive patients diagnosed with gout, assessed at the Rheumatology Clinic, Emergency County Hospital Craiova, along with 40 healthy controls. Ultrasound examinations were conducted using an Esaote MyLab system with a high-frequency linear probe (10–18 MHz). Musculoskeletal ultrasound (MSKUS) assessments were performed to evaluate elementary lesions of MSU crystal deposits as defined by OMERACT. Inflammation was evaluated based on local power Doppler (PD) signal, graded on a semiquantitative scale from 0 to 3. Carotid arteries were bilaterally examined for increased IMT and atheroma plaques following the Mannheim consensus.

Results. A CCAIMT greater than 0.9 mm was observed in 19 patients (29.23%), a statistically significant difference compared to controls (7 patients, 17.5%; p = 0.0428). Carotid plaques were detected in 23 patients (35.38%) during ultrasound examination, a significantly higher prevalence than controls (19 patients, 29.23%; p = 0.002). Multivariate logistic regression identified SUA (OR = 2.103; p = 0.0002), age (OR = 1.051; p < 0.001), disease duration (OR = 1.740; p = 0.0039), and LDLc (OR = 1.003; p = 0.0029) as independent factors associated with increased IMT in patients with gout. Similar results were obtained regarding carotid plaques. MSKUS performed on all patients yielded significant findings. The presence of deposits was associated with a higher risk of thickened IMT, with similar results observed for double contour sign, aggregates, and tophi. A statistically significant association was noted for the presence of deposits (p = 0.002). Regarding carotid atheroma plaques, identifying deposits, double contour sign, aggregates, tophi, and PD signal was linked to a higher risk.

Conclusions. Our findings confirm that carotid ultrasound is a readily accessible imaging technique that provides valuable predictors of atherosclerotic status.

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P210

AN OBSERVATIONAL ANALYSIS OF METABOLIC SYNDROME AND CARDIOVASCULAR RISK IN PATIENTS WITH PSORIASIS

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Objective. The study aimed to assess the prevalence of metabolic syndrome (MetS) in a cohort of psoriasis (PsO) patients and examine its association with subclinical atherosclerosis, as evaluated by carotid ultrasound.
Material and methods. We conducted an observational study involving 54 patients with psoriasis (PsO) admitted to the Dermatology Department of the Emergency County Hospital in Craiova, Romania, between August 2023 and January 2024, along with 40 control subjects. Results. The criteria for MetS were met by 35 of the psoriasis patients (64.81%) compared to 11 of the controls (27.5%), with a statistically significant difference (p=0.0003). When examining the components of MetS, significant differences were found in total cholesterol levels and waist circumference. Carotid ultrasound results showed an increased intima-media thickness (IMT) of over 0.9mm in 19 PsO patients (35.18%), significantly higher than in the control group. Additionally, carotid plaques were more prevalent in psoriasis patients (37.03%) compared to controls (17.5%, p=0.001). We also observed that patients with MetS had significantly higher average IMT values than those without MetS. The prevalence of carotid plaque was notably higher in psoriasis patients with MetS. In the PsO group, IMT was positively correlated with age, MetS, blood glucose levels, disease duration, and PASI score. However, only age and MetS remained independent predictors of carotid IMT after conducting multiple linear regression analysis (p=0.02 for age, p=0.001 for MetS).
Conclusion. Our findings support a strong association between metabolic syndrome and psoriasis, highlighting the increased cardiovascular risk in psoriasis patients, particularly those with MetS. These factors might offer deeper insights into the mechanisms driving the increased cardiovascular risk.
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P211

INFLUENCE OF POOR SLEEP QUALITY ON MUSCLE MASS AND STRENGTH IN OLDER ADULTS AT RISK OF FALLS

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Objective: The main objective of this study was to verify the influence of poor sleep quality on the loss of strength and muscle mass in older adults at risk of falls.
Methods: 94 participants were divided according to the sleep quality questionnaire as normal (N=50) and poor (N=44) sleep quality , dual energy x-ray absorptiometry (DXA) was used for total lean mass (TLM), appendicular skeletal mass (ASM/H²), bone mineral density (BMD). The performance tests was used handgrip strength (HGS), Short physical performance battery (SPPB) and Chair stand test (CST). For statistics, descriptive analysis, Mann-Whitney test for independent samples, Spearman correlation and Linear regression analysis were used.
Results: Total lean mass and performance tests show lower values compared to the normal sleep group. The correlation test was performed only in the poor sleep quality group. This group presented moderate and statistically significant between TLM and HGS, LBMD and FBMD. ASM presented moderate and significant statistical with SPPB, LBMD and CST. The influence of TLM was 54.5% on HGS, 27% in LBMD and 22% in FBMD.
Conclusion: We conclude that poor sleep appears to negatively affect muscle quality and physical performance, especially muscle strength in older adults, increasing the risk of falls. Therefore, we consider it important to verify the cause of non-restorative sleep in this population.

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THE RELATIONSHIP BETWEEN BODY MASS INDEX AND HIP FRACTURES IN OLDER IRISH ADULTS

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Objective
Higher body mass index (BMI) is associated with greater bone mineral density (BMD) which may protect against fracture at weightbearing sites such as the hip. However, increased adiposity is also associated with adipocytokines that are known to adversely affect bone quality. We aimed to investigate the relationship between BMI and hip fracture prevalence in patients attending out bone health clinic.
Material and Methods
We extracted data for analysis from our bone health clinic database. We then explored the cross-sectional association between those who were underweight (BMI < 18.5 kg/m²), overweight (BMI 25 – 30 kg/m²) and obese (BMI >30 kg/m²) and the prevalence of hip fracture adjusting for age and sex. The reference group for comparison was normal weight (BMI 18.5 – 25.0 kg/m²).
Results
There 5128 patients in analysis and 1093 (21.3%) had a history of hip fracture. Those who were underweight were more likely to have a hip fracture (OR 1.49, CI 1.13 – 1.95, p=0.001). Conversely, being overweight was associated with a reduced risk (OR 0.68, CI 0.58 – 0.80, p=0.001) which the risk reducing further with obesity (OR 0.61, CI 0.50 – 0.75, p=0.001).

Conclusion
Low body mass was associated with a 49% increased risk for hip fracture while the risk reduced by 32% in those who were overweight and 39% in obesity. This is likely to be explained by an increased BMD in patients with greater weight. It has also been hypothesized that fat tissue around the hip might attenuate the impact on falling which might reduce fracture risk. While obese patients may have a lower risk of hip fracture, they have a higher risk of complications post hip fracture repair.

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ULTRASOUND GUIDED RADIOFREQUENCY ABLATION FOR KNEE OSTEOARTHRITIS: ADVANCING PAIN MANAGEMENT SOLUTIONS

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Background: Knee osteoarthritis (KOA) is a chronic degenerative disease in the knee joint that commonly occurs in elderly patients. Among the various symptoms of knee osteoarthritis, pain is the leading limiting factor of physical activity and remains the major reason for knee joint replacement [1]. Radiofrequency ablation (RFA) of the genicular nerves is a minimally invasive technique that has been approved for efficacy as a treatment for the pain of chronic KOA [2]. Genicular nerve blocks under ultrasound guidance and subsequent RFA was later introduced and has been demonstrated to be as effective as fluoroscopicguided RFA, without the risk of radiation exposure, and to be less time consuming [3].
Objective: To evaluate the effectiveness of radiofrequency ablation (RFA) of genicular nerves guided by ultrasound in pain relief in patients with KOA.
Methods: Prospective observational study included 58 patients who had suffered from chronic knee joint pain for more than 6 months and grade III–IV KOA according to the Kellgren-Lawrence classification system. The patients underwent ultrasound-guided radiofrequency ablation of genicular nerves after showing a positive response to a diagnostic block. The target nerve selection principle was as follows: the superomedial genicular nerve (SMGN) branch and inferior medial genicular nerve
(IMGN) branch of the saphenous nerve and the superolateral genicular nerve (SLGN) branch of the femoral nerve . RFA at 80oC was performed for 120 seconds per nerve. Outcome assessments were performed at baseline and at 4 and 12 weeks post treatments using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC).
Results: Total of 101 knees of 56 patients underwent genicular nerve RFA. 16 knees were grade III KOA while 85 knees were grade IV KOA. 45 of the patients were bilateral and 11 were unilateral. The mean age of the patients was 65.11± 8.74, 44 of them were females while 12 were males. The mean of body mass index (kg/m2) was 27.61 ± 3.03. The mean of disease duration was 7.31 ± 3.01 years. There was significant improvement from baseline to post treatment in pain and physical function domains of the WOMAC with no significant improvement from baseline to post treatment in the stiffness domain. There was also significant improvement from baseline to post treatment in total WOMAC score. Mean of WOMAC scores at baseline, 4 weeks posttreatment and 12 weeks posttreatment in terms of pain (22.8 ±3.4, 11.9 ±1.4,12.5 ±1.6 respectively P<0.01), physical function (46.4 ± 2.63, 27.76 ± 3.3, 28.35 ± 3.17 respectively with p = 0.05).
and total score (62.71 ± 4.28, 34.69 ± 3.54, 36.09 ± 3.36 respectively with P<0.01) but not stiffness (3.5 ±0.88, 3.08 ±0.91, 3.18 ± 0.76 respectively P=0.336 , 0.273 respectively).
Conclusions: RFA of genicular nerves can significantly alleviate pain and improve functional outcomes in knee osteoarthritis patients.
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COMORBIDITIES IN RHEUMATOID ARTHIRITIS

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Objectives: Rheumatoid arthritis has a complex pathogenic mechanism, with a wide variety of antibodies, with multiple actions. In this context, we propose to highlight the complexity of this disease as a cofactor of increased risk in many other pathologies.
Material and method: we evaluated a group of 45 patients with rheumatoid arthritis with evolution over 5 years in synthetic remissive therapy, patients with biological therapy were not included in this study. All patients were evaluated in terms of disease activity using the DAS 28 composite index, the degree of disability using the Barthel questionnaire, the degree of osteoporosis using the T score, pulmonary radiological evaluation, cranian CT scan in patients with a history of stroke, evaluation of biological constants: blood test, transaminases, creatinine, urinealysis, urine culture.
Results: after the evaluation, we found that more than half of the patients presented predominantly urinary infections, a third of the patients presented cardiac disease - ischemic heart disease, arterial hypertension, less than 20% presented anemic syndrome, only one patient developed lung neoplasm, 3 patients have ischemic stroke.

Conclusions: our study on a small cohort of patients highlights comorbidities that require additional therapy, which shows that both, the disease and the treatment for polyarthritis, can be an inducing factor of other pathologies. More studies on larger cohorts are needed to highlight the types of comorbidities that may appear during the evolution and therapy of patients with rheumatoid arthritis.

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P215

THE ADVANTAGES OF USING THE BTS G-WALK SYSTEM IN THE STAGE EVALUATION OF THE RESULTS OF PHYSICAL-KINETIC THERAPY ADDRESSED TO PATIENTS WITH POST-TRAUMATIC KNEE DYSFUNCTION

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Objectives: assessment of the usefulness of the initial and stage assessment using the 6-minute walk test - within the BTS G – Walk system for the assessment of the effects on pain and walking obtained by association within the 14-day conservative therapeutic program dedicated to patients diagnosed with post-traumatic knee dysfunction , of physical therapeutic means.

Material and method: We organized a prospective, observational, randomized study on a group of 31 patients with Morton's neuritis. The patients were randomly divided into a control group (15 patients) who received only specific medication (group 1) and a study group - group 2- (16 patients), who additionally received physical therapy (where short, laser, orthotics, massage, physical therapy). Patients were evaluated initially and after 14 days of treatment. The monitored parameters were: pain (using visual analogue scales), joint balance, manual muscle testing, and to evaluate the functionality of the lower limb we used the 6-minute walking test - within the BTS G-Walk system.

Results: The score values for the functional parameters improved: the VAS pain score value decreased by 35.3% in group 2, compared to 24.1% in group 1 ($p=0.000053$); knee flexion range of motion improved (32.5% in group 2 vs. 19.1% in group 1) and locomotion improved more in patients in group 2 (41.3%) compared to group 1 (28.4%). The results had statistical significance ($p<0.05$).

Conclusions: The obtained results highlight the relief of pain and the improvement of functional parameters in the study group, certifying the effectiveness of the applied physical means of treatment. These findings motivate the continuation of the study for a longer period and a larger number of patients.

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FIBROMYALGIA A DISEASE OF THE MODERN AGE

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Objectives: fibromyalgia is an increasingly common diagnosis in medical offices. Many musculoskeletal pathologies are recently accompanied by fibromyalgia syndromes. The presence of increasing stress changes the patient's profile and psycho-emotional status, which leads to a re-evaluation of the pain perception threshold.

Material and method: we included in the study a number of 80 patients with lumbar and cervical discopathy and spondylosis and osteoarthritis, aged between 45 and 70 years. All patients were evaluated using the WPI Widespread Pain Index and the SS Severity Scale score, the VAS visual analog scale for pain. All patients followed a physical and kinetic program adapted to the pathology.

Results: at the initial examination we obtained scores that confirm fibromyalgia in 65% of the patients, and after a month of kinetic treatment the score dropped to 50%.

Conclusions: fibromyalgia is much underdiagnosed, in the current context of predominantly sedentary activity, against the backdrop of stress and sleep impairment. Involvement of patients in controlled physical kinetic programs could reduce the occurrence of fibromyalgia and the increase in pain perception threshold.

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ENDOTHELIAL AND PLATELET IMPAIRMENTS IN PRIMARY HYPERPARATHYROIDISM AND HYPOPARATHYROIDISM

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Objective. Both primary hyperparathyroidism (PHPT) and chronic hypoparathyroidism (HypoPT) are associated with the onset and development of cardiovascular diseases (CVDs). Endothelium is a recognized target tissue of PTH and there is an increasing body of evidence that PTH affects functional and structural properties of arteries. However, the molecular mechanisms underlying the effects of parathyroid disorders on endothelial dysfunction and platelet aggregation, two main determinants of CVDs, are not

completely understood.
Aim. To evaluate the effects of PHPT and HypoPT on oxidative stress, endothelial and platelet function.
Material and methods: in a monocentric, cross-sectional study we enrolled hypoPT patients treated with calcium and calcitriol, PHPT subjects and age-matched controls. All patients underwent a biochemical examination including calcium-phosphorus metabolism, inflammation markers, circulating levels of markers of oxidative stress, endothelial function, and platelet activation. Moreover, we evaluated brachial artery endothelial function (flow-mediated dilation-FMD), common carotid intima-media thickness (ccIMT), diastolic function and global strain measures with ultrasound.
Results. These are the results of this project that included 120 subjects (40 hypoPT, 40 PHPT and 40 age- and sex-matched control subjects). HypoPT and PHPT patients showed increased oxidative stress markers as compared to control subjects (p<0.001). Among patients with parathyroid disorders, those with PHPT demonstrated the highest reduction of nitric oxide (p<0.001 versus HypoPT and controls) and FMD (p<0.001 and p=0.001) and a marked increase of IMT (p<0.001 and p=0.001). We also observed an increased platelet aggregation in patients with parathyroid disorders, with the highest values in PHPT patients (p<0.001, PHPT vs controls; p=0.006, HypoPT vs controls; p<0.001, PHPT vs HypoPT), along with increased levels of soluble P selectin and thromboxane B2.
Conclusions. PHPT and HypoPT patients have increased atherothrombotic risk due to endothelial and platelet function alterations. Our results suggest that PTH may influence platelet reactivity. Further research is needed to determine if personalized antiplatelet therapy is necessary in subjects with parathyroid disorders.

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IMPAIRED NEURAL PLASTICITY MECHANISMS IN HYPOPARATHYROIDISM

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Objective: Chronic hypoparathyroidism (hypoPT) is characterized by low serum calcium levels, accompanied by low or inappropriately normal levels of parathyroid hormone (PTH). The conventional treatment involves the use of activated vitamin D and/or calcium supplements. Many hypoPT patients experience symptoms that indicate a decline in their quality of life. These symptoms often include physical issues (such as fatigue, increased susceptibility to fatigue, muscle spasms, pain, and paresthesia), cognitive symptoms (such as "brain fog", difficulty concentrating, slow processing speed, executive function, auditory memory, and visual memory), and emotional struggles. Transcranial magnetic stimulation (TMS) is a powerful tool to evaluate, in vivo, cortical excitability and brain circuits functioning.
Purpose: we aimed to investigate cortical excitability, circuit functioning, and plasticity propensity in hypoPT in comparison with controls.
Material and Methods: we enrolled hypoPT treated with calcium and calcitriol and age-matched controls. All subjects underwent a biochemical examination including calcium-phosphorus metabolism. Moreover, cognitive status was evaluated using the validated Telephone-based Mini-Mental State Examination (itel-MMSE). Participants without significant cognitive impairment underwent transcranial magnetic stimulation (TMS), assessing cortical excitability (motor evoked potentials-MEP), circuit functioning (short-latency afferent inhibition and short intracortical inhibition), and plasticity via intermittent theta burst (iTBS) protocol. MEP amplitude was measured before and after iTBS and compared between patient and age-matched healthy control group. A patient subgroup had TMS recordings repeated after initiating PTH treatment [3 subjects on PTH(1-34) and 3 subjects on Palopegteriparatide].
Results: these are the results of this project that included 44 subjects (32 hypoPT and 12 controls). HypoPT patients had significantly lower PTH and calcium levels (p<0.001) and higher phosphorus levels (p<0.001) than controls. MEP amplitude changes after iTBS differed significantly between patients and controls (-0.02 mV vs 0.33 mV, p:0.03). Patients undergoing PTH replacement therapy showed MEP amplitude responses similar to controls (-0.3 mV vs 0.3 mV, p:0.04). No other statistically significant differences were observed in TMS parameters.
Conclusion: our findings suggest that hypoPT present a functional impairment of neural plasticity mechanisms. PTH replacement therapy seems to restore this impairment, but we believe that further comprehensive studies are needed.

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CONSENSUS ON ADVANCEMENTS IN MUSCULOSKELETAL REHABILITATION AND PHYSIOTHERAPY: INSIGHTS FROM A VIRTUAL SYMPOSIUM OF 623 EXPERTS ON EVIDENCE-BASED PRACTICES

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Introduction: This study aimed to establish a consensus on emerging evidence and advancements in rehabilitation and physiotherapy within the Indian healthcare setting. By focusing on contemporary clinical developments, the symposium aimed to develop agreement on best practices, guide future directions, and create contextually relevant approaches for physiotherapists in India.

Methods: The virtual symposium, *Vital Musculoskeletal Learning & Insights of New Innovations in Physiotherapy*, held on 8th September 2024, celebrated World Physiotherapy Day. It included four core panelists and 623 physiotherapists from diverse regions, collectively representing over 7,500 man-years of clinical experience. A structured, evidence-based questionnaire with 17 questions was developed, focusing on contemporary innovations. Participants rated statements using a 5-point Likert scale. Statistical analysis was performed using GraphPad 10.3.0, with consensus defined as a weighted score exceeding 100.
Results: Key findings include: 71.5% strongly agreed that YouTube is unreliable for shoulder joint mobilization techniques (Weighted Score: 124.5); 77.6% agreed on the effectiveness of the Laser Shoe in reducing neuropathic pain in diabetes patients (Weighted Score: 123.5); 50.9% strongly agreed that core exercises improve balance, mobility, and quality of life post-Total Knee Arthroplasty (Weighted Score: 123.0); 44.8% strongly agreed that aquatic therapy enhances postural balance and muscle strength in chronic stroke patients (Weighted Score: 122.8); 69.3% strongly agreed that diaphragmatic breathing combined with core exercises improves pain and disability in chronic low back pain (Weighted Score: 122.7); and 41.8% strongly agreed that Diclofenac diethylamine 2.32% gel applied twice daily is effective for acute ankle sprains (Weighted Score: 121.8). The overall mean response scores were: Agree: 53±20 (95% CI 43 to 63), Strongly agree: 46±21 (95% CI 35 to 57), $p<0.0001$.
Discussion: The symposium successfully established consensus on key advancements in rehabilitation, including core exercises, aquatic therapy, and emerging technologies like the Laser Shoe. Strong agreement was noted on the effectiveness and convenience of Diclofenac diethylamine 2.32% gel. These findings emphasize the importance of evidence-based approaches in physiotherapy, offering valuable insights into effective interventions that enhance patient outcomes. The consensus supports tailored rehabilitation strategies for the Indian healthcare context, guiding clinical practice and future research.

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IMPACT OF HOUSEHOLD CHARACTERISTICS ON PATIENT OUTCOMES POST HIP FRACTURE: A RETROSPECTIVE OBSERVATIONAL STUDY IN LONG-TERM RHEABILITATION FACILITIES

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Objective
Hip fracture is common in older people and has significant health and care implications. Objective of the study is to verify whether household characteristics have influenced the clinical outcome upon discharg in hip fracture patients in long-term rehabilitation.
Material and Methods
In a retrospective observational study in a long- term care 3054 patients,from1/1/21 to 30/6/24, were analysed. We selected 518 patients with hip fracture correlating them with the number of days of hospitalization and the outcame dimmission: return home, return home with hiring a paid carer, activation of home nursing service, other hospital, retirement home, emergency room, voluntary resignation or death.The caregiver profile which was divided in : daughter/son and others During the entrance interview with the care giver , a hypothesis of discharge outcome was made with the care giver which was correlated with the actual discharge destination upon discharge
Results:
The average age in the cluster analyzed is 81.1. The sample analyzed is 70,2% female and 29.8% male. The average hospital stay is 31.125. Our data show how caregiver characteristics change discharge outcomes. Significantly increasing the days of hospitalization if the caregiver is not a first-degree relative.The expected discharge method also changes based on the type of caregiver. the caregivers were divided into: first degree relatives (daughters and sons) and others. Caregivers represented by sons and daughters had a significantly lower average hospital stay than other caregivers 25.45 days versus 36.8 with a standard deviation 8.025. The discharge method changes significantly based on what was assumed at the time of admission based on the type of caregive. The type of discharge was divided into home, home with assistance, acute hospital, nursing home, hospice, emergency room voluntary discharged. First degree relatives are more efficient with regard to actual discharge rather than planned discharge with a standard deviation 6.71.
Conclusions:
The data analyzed confirm that impact of household characteristics is statistically significant both with regard to the average hospital stay and the patient's expected discharge.Collecting data regarding the type of caregiver is important from the moment the patient enters the facility in order to better share the patient's journey

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OSTEOGENESIS IMPERFECTA-CASE REPORT

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A heritable disease in which bones fracture easily, often with no obvious cause or minimal injury.
In this case we observe mother and daughter suffering from OI - the mother is 32 years old, disabled since she was 3 years old, with 128 fractures so far, 60% damaged hearing, HA, 60 surgeries, problems with breathing and on the other side, a 9-year old daughter, with 6 fractures so far, spondylolysthesis and by this moment, only pain in the ears. Both have blue sclera, triangular face, muscle weakness. The disease in both patients is confirmed with genetic testings and radiological studies, bone densitometry and laboratory by MANU. The treatment is non-specific. It is a multidisciplinary, involving medical, orthopaedic, physiotherapy and rehabilitation specialists. Bisphosphonates, vitamin D and calcium, several surgeries for correction of bone deformities. In the most common forms, people with OI have a gene that

carries incorrect instructions in one copy of the gene for making collagen, a substance that makes bones strong. The gene causes the body to not make enough collagen or the collagen does not work properly and this leads to weak bones that break easily. In most cases, patients with OI inherit this gene from one parent or in other forms, a mutation in gene from both parents. The disease can be in dominant or recessive form. It is still not clear, will the test that are by this moment performed only on laboratory mice, also be performed on patients in future. Maybe in future we should give more accent and make the OI community more knowledgeable about OI genetics and the concept of gene therapy.
Overall, OI is a condition that requires ongoing management, but with appropriate care, many patients with OI can lead active lives.

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CASE REPORT – HUNGRY BONE SYNDROME IN CASE OF MULTIPLE MYELOMA

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We present the case of prolonged hypocalcemia in a 76-year old man, with prior history of type 2 diabetes, chronic kidney disease(CKD stage 2), and multiple myeloma (MM) diagnosed one month ago with multiple lytic lesions. Prior to current presentation, the patient received 2 doses of denosumab- first (60 mg) for hypercalcemia with acute kidney injury (1 month back; lead to the diagnosis of MM) and second (120 mg) along with the first chemotherapy dose. He was diagnosed to have asymptomatic hypocalcaemia, during the second chemotherapy session. Labs revealed albumin-corrected calcium: 7.1 mg/dL (8.4-10.2), creatinine: 3.7 mg/dL (0.2-1.2), magnesium 1.4 mg/dL (1.8-2.6), phosphate: 2.9 mg/dL (2.5-5), 25-hydroxy vitamin D: 45.3 ng/mL (30-50). Trousseau and Chvostek signs were negative, but EKG showed QTc prolongation(520 ms).
He received intravenous calcium gluconate after endocrinology reference and was discharged on calcium carbonate 1000 mg TID and calcitriol 0.25 mcg TID. Due to Hypocalcemia (6.1-7.9 mg/dL), hypophosphatemia (3-3.4 mg/dL at CKD4-5) and hypomagnesemia (1-1.7 mg/dL) persisted during follow-up despite up-titrating calcitriol (0.5 mcg TID) and supplementing magnesium (100 mg/day). This prompted further investigations: parathyroid hormone (PTH; 252.2-315.8 pg/mL), alkaline phosphatase (ALP; 221-307IU/L), 24-hour urinary calcium: 34.2 mg/g creatinine, C-terminal telopeptide of type I collagen (CTX; 970 pg/mL), and procollagen type 1 N-terminal propeptide (P1NP; 199.6 ng/mL). In the patient, prolonged hypocalcemia, hypophosphatemia, hypomagnesemia, and elevated CTX, P1NP, ALP confirmes the diagnosis of hungry bone syndrome (HBS). After gradual biochemical improvement (Table 1), serum calcium normalized to 8.4 mg/dl and doses of calcium and calcitriol were reduced.

Conclusion

HBS can cause prolonged hypocalcemia due to rapid remineralization of diseased bone following profound osteoclast suppression. This case highlights a rare occurrence of HBS after denosumab in MM, emphasizing the need for monitoring in similar patients.

Table 1- Serial Biochemical parameters on follow-up

Date	23/9/24	24/9/24	25/9/24	26/9/24	27/9/24	28/9/24	14/10/24
Ca (mg/dl)	7.1	8	7.1	-	6.3	6.8	6.1
Albumin mg/dl	-	-	-	-	-	-	3.3
Corrected Ca(mg/dl)	-	-	-	-	-	-	6.6
P04(mg/dl)	-	-	-	-	-	-	3
Creatinine (mg/dl)	3.7	3.6	3.5	3.5	3.3	3.3	2.7
ALP IU/L	-	-	-	-	-	-	221
AST IU/L	-	-	-	-	-	-	8
ALT IU/L	-	-	-	-	-	-	7
Hb (gm/dl)		7.5	8.3	7.6	7.3	7.4	98
I PTH ng/ml	-	-	-	-	-	-	252.18

Serial Biochemical parameters on follow-up (Table 1 continued)

Date	17/10/24	24/10/24	3/11/24	11/11/24	17/11/24	27/11/24	12/12/24
Ca(mg/dl)	6.4	6	6.2	7.2	7.7	8.2	8.4
Albumin(mg/dl)	3.2	3.3	3.5	3.3	3.3	3.3	3.5
Corrected Ca(mg/dl)	7.04	6.64	6.6	7.76	7.96	8.76	8.8
PO4(mg/dl)	-	-	-	3.1	3	3.3	3.3
Mg(mg/dl)				1.30	1.75	1.57	1.84
Creatinine (mg/dl)	2.5	2.1	1.8	1.5	1.6	1.6	1.4
ALP(IU/L)	261	307	234	134	122	75	62
AST(IU/L)	7	8	9	4	5	5	5
ALT(IU/L)	7	6	9	8	9	10	8
Hb(mg/dl)	8.4	7.2	8.3	7	-	-	-
I PTH(pg/ml)	-	-	-	315.81			
BetaCTX-(pg/ml)	-	-	-	970	-	-	-
P1NP (ng/ml)	-	-	-	199.6	-	-	-

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THE ASSOCIATION BETWEEN THE DURATION OF DM AND BLOOD SUGAR CONTROL WITH OSTEOARTHRITIS SEVERITY AMONG PATIENTS ATTENDING THE ORTHOPEDIC CLINICS AT KING ABDULLAH MEDICAL CITY, MAKKAH, SAUDI ARABIA

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Background: Osteoarthritis (OA) has become the most common chronic condition affecting the knee. Evidence suggests a possible link between diabetes mellitus (DM) and the amplification of OA symptoms and severity.
Objectives: The aim of this research is to determine the association between the duration of diabetes mellitus (DM) and blood sugar control, with the severity of knee osteoarthritis (KOA).
Material and Method: A retrospective cross-sectional study design was used with a sample size 211 diabetic patients with knee osteoarthritis who attended the orthopedic clinic at King Abdullah Medical City (KAMC). The collection of data encompassing age, gender, medical history associated with diabetes mellitus, and knee osteoarthritis was collected from patient medical records, and the grading of knee osteoarthritis severity was determined through the application of the Kellgren and Lawrence system.
Results: There was a good positive correlation between HbA1c and the severity of osteoarthritis (r = 0.015). The severity of knee osteoarthritis was higher among the patients who had diabetes for >10 years.
Conclusion: Research found a strong link between high HbA1c levels and the severity of knee osteoarthritis. Long-term diabetes patients had more severe osteoarthritis symptoms. Based on the study findings, we recommend implementing educational programs on osteoarthritis awareness for individuals with diabetes.

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DIXON MRI FOR ASSESSMENT OF BONE MARROW FAT FRACTION IN TYPE 2 DIABETES

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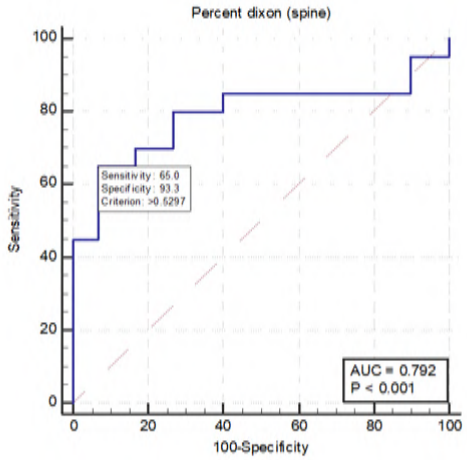
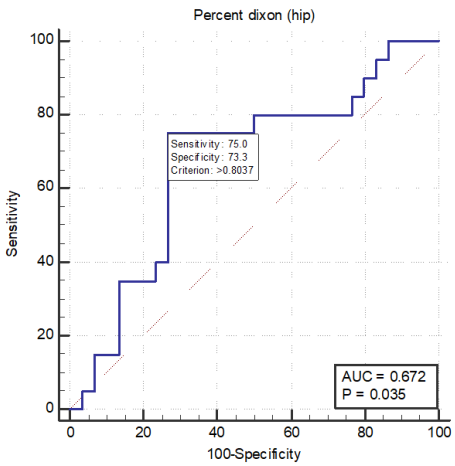
Objective: Diabetes is associated with increased fracture risk. As evidence that other components besides the mineral component may be important in the evaluation of bone strength. Dixon MRI can be used to quantify bone marrow fats by assessing the fat fraction (FF) in bone marrow.
Material and methods: This case control study was carried out at Mansoura Specialized Medical Hospital, Endocrinology Outpatient Clinic, and radiology department Mansoura University. It included 38 premenopausal females and ≤50 years males patients with type 2 diabetes and 30 normal healthy age, sex, and BMI matched population. Sagittal and Coronal Dixon MRI were carried out at lumbosacral spines and both hips respectively.
Results: FF measured by Dixon MRI at spines but not at hips was significantly higher in diabetics than controls and was significantly correlated with fat fraction at hip and age of patients. ROC curve analysis showed that FF >0.5297 at spine, (with sensitivity of 66% and specificity of 93.3%) and >0.8037 at hip (with sensitivity of 75% and specificity of 73.3%) can differentiate increase bone marrow fat in diabetes from control group.
Conclusion: Higher bone marrow fat in diabetes could be identified as a potential marker for diabetes-related skeletal fragility that can be used as potential therapeutic target .





P225

ULTRASOUND-BASED EVALUATION OF SHOULDER COMPLICATIONS IN TYPE 2 DIABETES MELLITUS: A RETROSPECTIVE ANALYSIS

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Objectives: To evaluate the prevalence and characteristics of structural alterations in the rotator cuff among diabetic patients.
Methods: This retrospective observational study analyzed data

from patients admitted to the Rheumatology department between April 2022 and December 2024. The patients considered eligible were previously diagnosed with T2DM using ADA 2018 criteria, had been undergoing long-term treatment with oral anti-diabetic drugs and reported subjective complaints of chronic pain and functional impairment of the shoulder. The shoulder involvement was assessed using musculoskeletal ultrasonography with a 12MHz linear probe.
Results: A total of 100 patients were included (64 females, 36 males). The mean age was 66,4 and the average HbA1c was 7,4 % (range: 4.7-11.2%). The vast majority of participants were overweight, with only six having a normal body mass index. The most affected tendon was the supraspinatus, as follows: 71% of the subjects exhibited intra-tendinous calcifications (p=0,002, 95% confidence intervals (CI) 0,033-0,149), 50 % had a full-thickness supraspinatus tendon tear (p=0,03, CI: 0,004-0,135), 49 % had a partial tear and 40% had insertional enthesophytes. The second most injured tendon was the subscapularis, with the most prevalent lesions being full-thickness tears (11%) and calcifications (30%). Only 21 participants exhibited involvement of the infraspinatus. Subacromial-subdeltoid bursitis was also present in 38% of the individuals.
Conclusions: Although changes in the musculoskeletal system are not among the most common complications of diabetes mellitus, the impact on the patients' quality of life is particularly significant in terms of limited mobility and functionality, chronic pain and total discomfort. The present study demonstrates that a significant percentage of the T2DM patients encounter rotator cuff pathology, with the supraspinatus being the most frequently affected site. Ultrasonographic screening could be a useful tool for early detection and management of the musculoskeletal impairments in diabetes mellitus.
Mușetescu AE et al. Life. 2022; 12(4):470.
Gherghina FL et al. Rom J Morphol Embryol. 2016;57(3):1107-1116.

P226

CYSTIC LUNG DISEASE IN PRIMARY SJÖGREN'S SYNDROME- AN UNDERDIAGNOSED ENTITY: A SERIAL CASE REPORT

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Objective: Combined pulmonary fibrosis and emphysema is a rare phenotype of diffuse interstitial pneumopathy identified in primary Sjögren's syndrome (pSS), which usually consists of pan-lobular pulmonary emphysema of the upper lobes and basal interstitial features similar to usual interstitial pneumonia. We present a case series with this particular pulmonary phenotype.
Material and Methods: We analyzed 6 patients aged between 43 and 66 years (5 women, 1 man) diagnosed with pSS for several years, who had associated atypical lung damage in evolution.
Results: The patients presented clinical symptoms of sicca syndrome, fatigue, inflammatory pain in the small joints of the hands and feet, without significant respiratory symptoms or radiographic changes, high titers of anti-SS-A, anti-Ro52 antibodies and RF in all cases, anti-SS-B antibodies- 3 cases, C3 hypocomplementemia- 3 cases, C4- 2 cases, hypergammaglobulinemia, persistent inflammatory biological syndrome, intense inhomogeneous aspect of the glandular parenchyma, multiple hypoechoic areas >2mm and hyperechoic bands, with positive Power Doppler signal at ultrasonography of the salivary glands and a positive result for lymphocytic sialadenitis on lip biopsy. One of the patients presented hematological damage with severe thrombocytopenia-5000/mmc. HRCT revealed a cystic aspect of the lung parenchyma characterized by the presence of numerous panlobular and/or subpleural emphysema bubbles, with thin walls, located predominantly in the upper lobes and basal or diffuse fibrotic lesions. DLCO showed a quantified reduction in 2 of the patients (70%, 62%), without significant plethysmographic changes.
Conclusions: Emphysema is a rare manifestation of pSS, usually not visualized on chest X-ray, and awareness of this association may lead to an earlier diagnosis and allow early initiation of immunosuppressive treatment. In patients with seropositivity for anti-SS-A and anti-Ro52 antibodies, clinical screening and lung function tests are necessary for monitoring and should include chest HRCT especially if there is a reduction in DLCO.
Reference: Mușetescu AE et al. Life. 2022; 12(4):470.
Gherghina FL et al. Rom J Morphol Embryol. 2016;57(3):1107-1116.

P227

OSTEOPOROSIS IN A WOMEN WITH A RARE BLOOD DISORDER

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Objectives
Secondary osteoporosis is a common clinical entity. It is also common in patients with hematological diseases such as β-Thalassemia Major, multiple myeloma and hemophilia. The pathophysiological mechanism causing bone loss is still under investigation
Patient a method
We report a case of osteoporosis in a 65 -year- old women with a myelodysplastic syndrome with mutation in SF3B1 (Exon 15, c. 2098A>G) and JAK2 (Exon 14, c.1849G>T). Patient received Denosumab for 5 years, however, she performed vertebrae fractures in lumbar spine (L3, L4, L5). Consequently, she received alendronate for one year and she also performed vertebrae fractures in thoracic spine (T9 and T12). Finally, she received zolendronic acid iv once per year with calcium and vitamin D.

Results
Two years of zolendronic acid resulted in improvement in Bone Mineral Density and patient has not new osteoporotic fractures.
Conclusions
Zolendronic acid is very effective treatment for protection of osteoporotic fractures and it appeared to be more effective than other bisphosphonates and denosumab, so that could first line treatment in these patients. This result is in agreement with administration of other hematological disorders in reducing osteoporotic fractures
Key words: osteoporosis, bone mineral density, zolendronic acid

P228

VARIATIONS IN POST-OPERATIVE FOLLOW-UP OF PATIENTS UNDERGOING ARTHROPLASTY FOR OSTEOARTHRITIS

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Introduction: There were wide variations in follow-up protocols for knee and hip osteoarthritis patients treated with arthroplasty in the Mersey and West Lancs (MWL) NHS Trust, after being discharged. Following the results, the investigation was taken across the united Kingdom and beyond.
Objective: To regularize and improve the arthroplasty follow-up service.
Inclusion: Patients undergoing primary arthroplasty
Exclusion: Revision arthroplasty, infected, dislocated joint replacements, peri-prosthetic fractures.
Methods: With the help of Google Forms, a questionnaire was sent across to all the Orthopaedic consultants of MWL NHS Trust. The response was then analyzed. The questionnaire was then forwarded to Orthopaedic colleagues in various centres across the world.
Results: There was a wide variation observed in both the timing and types of radiographs requested at follow-up clinics.
Conclusion: We reviewed the follow-up recommendations by various Orthopaedic associations.
Discussion: We suggest an economic and safe protocol for review of arthroplasty patients in Follow-up clinics.

P229

IMPACT OF THE FLS MODEL ON PATIENTS WITH MAJOR FRACTURE IN GRAN CANARIA; 2018-2022 EXPERIENCE

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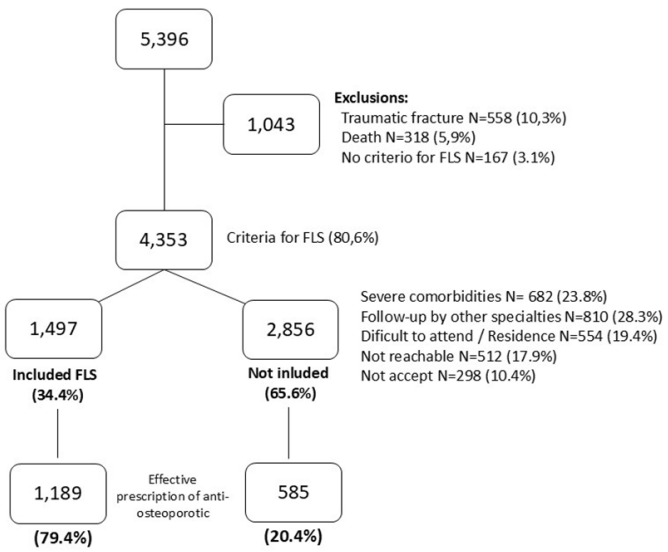
Introduction: The Fracture Liaison Service (FLS) is the most effective model for secondary prevention.
Objectives: To analyze THE impact of the FLS unit on the prevention of new fractures.
Methods: Patients >50 years were attended at the emergency department for fractures of the proximal femur, proximal humerus, distal forearm, pelvis or vertebra during the period 2018-2022 were included. A file was constructed containing demographic data, type of fracture, inclusion in the FLS and the initiation of treatment to prevent new fractures. A sample of patients not treated at the FLS was selected for estimating the prophylaxis of fractures under standard care management.
Results: A total of 5,396 patients were included, 74.2% women, with a mean age of 74 years. After excluding 558 traumatic fractures (10.3%), 318 (5.9%) deaths, and 167 (3.1%) cases due to a lack of criteria, the sample of potential patients who were candidates for FLS was 4,353. This represented 80.6% of the initial sample, of which 1,497 patients (34.4%) were attended at the unit. Factors independently associated with referral to the FLS were younger age (OR 0.97; 95% CI 0.97-0.98), female sex (OR 2.24; 95% CI: 1.91-0.98). 2.61) and humerus fracture (OR 1.34; 95% CI: 1.16-1.55). Treatment to prevent fractures was verified in 1,189 patients (79.4%) in the FLS group and in 585 (20.4%) of those with fragility fractures who were not included. At the healthcare level, the services provided by the FLS resulted in an increase of treated patients from 20% in standard care to 41% with the FLS model.

		Assessed by the FLS		
	total	No	Yes	%
Hip	1,541	1,068	473	30.7
Distal forearm	1,220	732	488	40.0
Humerus	904	524	380	42.0
Vertebra	400	276	124	31.0
Pelvis	288	256	32	11.1



Conclusions: In terms of treatment initiation to new fractures prevention at the healthcare level the FLS achieved a two-fold increase. The high incidence of fractures and the progressive aging of the population underlines the effectiveness of the FLS secondary prevention model.

P230

SUBTROCHANTERIC FEMORAL FRACTURES (ATYPICAL OR NOT) AND PREVIOUS TREATMENT WITH BISPHOSPHONATE

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Introduction: The subtrochanteric femoral fracture requires special attention in a *Fracture Liaison Service* (FLS) unit to screen for atypical fracture.
Objectives: To analyze the characteristics of the subtrochanteric fracture in a FLS.
Methods: Patients >50 years were attended for fragility fracture of the proximal femur during the period 2022-2024 were included. The type of fracture and fracture risk factors as well as previous treatment for osteoporosis were analyzed. For atypical femoral fracture we applied ≥4 of the following major criteria (Shane et al. J Bone Miner Res. 2014): 1) No or minimal trauma; 2) line begins laterally and is basically transverse; 3) may progress to complete with medial spicule; 4) not comminuted or minimally comminuted; and 5) periosteal thickening in external cortex.
Results: A total of 390 patients were included, 82.8% women, mean age 79 years. 192 (49%) fractures were of the femoral neck, 142 were pertrochanteric (43%) and 30 (7%) were subtrochanteric. The table shows the characteristics of the patients. The subtrochanteric fracture was associated with a higher body mass index and previous treatment with bisphosphonate. Multivariate analysis resulted in OR 1.124 (95% CI 1.045-1.209; *p*=0.002) for BMI and OR 2.811 (95% CI 1.146-6.895; *p*=0.02) for previous bisphosphonate. In patients with subtrochanteric fracture, 6 had received alendronate, 1 risedronate and 1 denosumab. One patient (previous alendronate) met criteria for atypical femoral fracture (0.25% of the whole sample, 3.3% of subtrocanteric type and 2.1% of patients with previous treatment with bisphosphonate or denosumab). None of the patients had a contralateral femoral fracture during the average follow-up of 24 months.

	All patients (n=390)	Subcapital or pertrocanteric hip fracture (n=360)	Subtrocanteric hip fracture (n=30)	p
Female, N (%)	323 (82.8)	297 (82.5)	26 (86.6)	0.56
Age, mean (SD)	79.0 (9.3)	78.9 (9.4)	80.0 (7.4)	0.50
Assessment during admission, N (%)	248 (63.6)	240 (66.6)	22 (73.3)	0.45
Years of education <8, N (%)	311 (79.7)	284 (78.8)	27 (90)	0.14
Risk factors, N (%)				
Body mass index, mean (SD)	25.9 (5.0)	25.8 (4.7)	28.7 (5.3)	<0.001
Previous fragility fracture	99 (25.3)	86 (23.9)	11 (36.6)	0.12
Parent hip fracture	69 (17.7)	63 (17.5)	6 (20)	0.73
Current smoker	45 (11.5)	42 (11.6)	3 (10)	0.78
Glucocorticoids	30 (7.7)	26 (7.2)	4 (13.3)	0.22
Rheumatoid arthritis	13 (3.3)	12 (3.3)	1 (3.3)	0.99
Secondary osteoporosis	76 (19.5)	68 (18.8)	8 (26.6)	0.30
Alcohol	15 (3.8)	14 (3.8)	1 (3.3)	0.63
Previous densitometry, N (%)	100 (25.6)	89 (24.7)	11 (36.6)	0.15
Femoral neck T score, mean (SD)	-2.1 (1.0)	-2.2 (1.0)	-2.0 (1.1)	0.36
Previous bisphosphonate or denosumab, N (%)	47 (12.0)	39 (10.8)	8 (26.6)	0.01

Conclusions: Subtrocanteric femoral fractures are associated with higher BMI and the use of bisphosphonate or denosumab. Atypical fracture is rare, accounting only 3% of subtrocanteric type.

P231

ADHERENCE TO ROMOSOZUMAB VERSUS PTH ANALOGUES IN PATIENTS WITH VERY HIGH RISK OF FRACTURE

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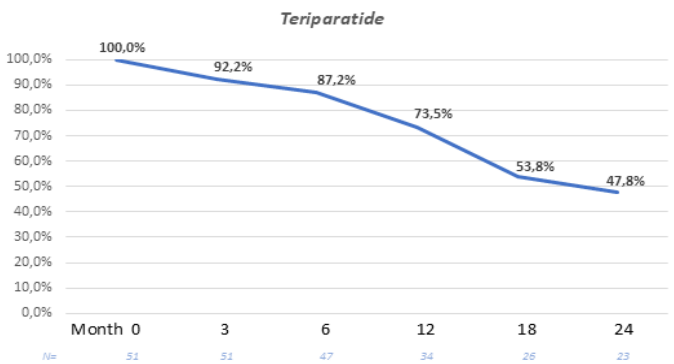
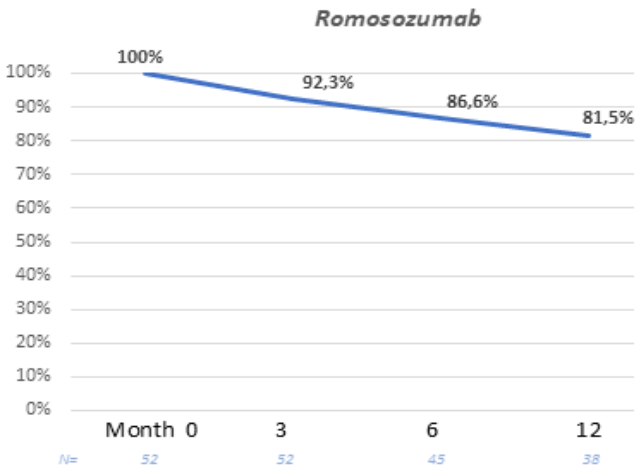
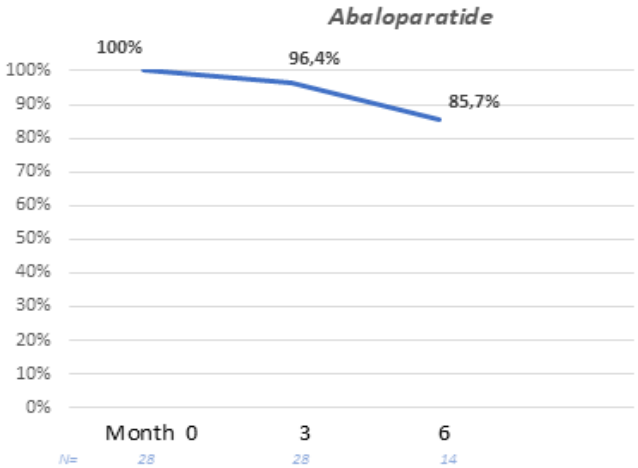
Introduction: Adherence to treatment to prevent fractures is a key point in the management of osteoporosis, especially in those with high risk of fracture. The introduction of romosozumab (RMZ) and abaloparatide (ABL) in Europe leads us to consider whether the patient profile and adherence are similar to teriparatide (TPT).
Objectives: To analyze the characteristics of patients prescribed anabolics in a reference hospital and their adherence to treatment.
Methods: Patients from the FLS unit and monographic clinic who were prescribed an anabolic (TPT, ABL, RMZ) in the last 5 years were analyzed. Demographic data and fracture risk factors, densitometric values, BMI and previous treatment for osteoporosis were collected. An expert nurse instructed the patients for subcutaneous administration of the drug. The criterion for including a patient was having at least one electronic prescription of anabolic. Adherence was assessed by dispensing in the pharmacy, recording the reason for suspension if applicable.
Results: 131 patients were included, 51 treated with TPT, 28 with ABL and 52 with RMZ (table). None of the patients in the RMZ group had high cardiovascular (CV) risk or a history of CV events. Vertebral fracture was the most frequent fracture, 72% in the TPT group, 70% in the ABL group and 67% in the RMZ group.
Adherence at 6 months was >85% with TPT, ABL and RMZ. Adherence at 12 months was 73.5% with TPT and 81.5% with RMZ (p=0.14). Adherence to the complete treatment regimen was 48%

with TPT and 81% with RMZ (p<0.01) (figure).
The reason for suspension was an adverse effect in half of the cases of TPT, ABL and RMZ, while in the rest of the cases the reason was the patient refusal.
Conclusions: The profile of patients with anabolic treatment is consistent with current guidelines. Adherence at 6 months is similar for TPT, ABL and RMZ, but adherence to full treatment is significantly higher for RMZ.
Key words: fracture liaison service; teriparatide; abaloparatide; romosozumab; adherence

	Teriparatide (n=51)	Abaloparatide (n=28)	Romosozum-ab (n=52)
Female, N (%)	40 (78.4)	28 (100)	52 (100)
Age, mean (SD)	72.3 (13.2)	74.9 (8.7)	68,3 (6.1)
Risk factors, N (%)			
Body mass index <18,5	4 (7.8)	1 (3.5)	4 (7.7)
Body mass index, mean (SD)	26.6 (5.2)	25.8 (4.5)	25.5 (5.4)
Fragility fracture	51 (100)	21 (75.0)	52 (100)
Fragility fracture < 12 months	47 (92.1)	17 (60.7)	50 (96.1)
Parent hip fracture	4 (7.8)	4 (14.3)	7 (13.4)
Current smoker	6 (11.7)	4 (14.3)	10 (19.2)
Glucocorticoids	9 (17.6)	1 (3.5)	8 (15.3)
Rheumatoid arthritis	0	0	0
Secondary osteoporosis	8 (15.6)	5 (17.8)	15 (28.8)
Alcohol	3 (5.8)	0	0
Lumbar T score, mean (SD	-3.2 (1.2)	-3.8 (0.9)	-3.7 (0,8)
Femoral neck T score, mean (SD	-2.5 (0.8)	-2.8 (0.8)	-2.7 (0.8)
Femoral neck or lumbar T score < -3	33 (64.7)	25 (89.2)	52 (100)
Previous treatment for osteoporosis, N (%)	8 (15.6)	6 (21.4)	11 (21.1)







P232

OSTEOPOROSIS IN RHEUMATOID ARTHRITIS: COMPARATIVE INSIGHTS INTO SEROPOSITIVE AND SERONEGATIVE SUBTYPES

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Background: Rheumatoid arthritis (RA), a systemic autoimmune disease, is classified into seropositive (SPRA) and seronegative (SNRA) subtypes, with osteoporosis (OP) being a significant comorbidity. SPRA is characterized by serological markers like rheumatoid factor (RF) and anti-citrullinated protein antibodies (ACPA), whereas SNRA lacks these markers, complicating early diagnosis and intervention.
Objective: This study aimed to compare OP prevalence, clinical manifestations, and systemic complications in SPRA and SNRA patients, with a focus on bone health and inflammatory markers.
Methods: A total of 100 RA patients (50 SPRA, 50 SNRA) meeting ACR/EULAR 2010 criteria underwent comprehensive clinical and paraclinical evaluations, including disease activity (DAS28), bone mineral density (BMD) assessment via dual-energy X-ray absorptiometry (DXA), and systemic complication analysis. Quality

of life was assessed using the Health Assessment Questionnaire (HAQ).

Results:

• Osteoporosis prevalence: OP was more frequent in SPRA (48% vs. 30% in SNRA, $p < 0.05$), particularly in patients with high inflammatory activity. Vertebral fractures were observed in 18% of SPRA patients compared to 6% in SNRA.

• Bone Mineral Density (BMD): SPRA patients had significantly lower BMD at the lumbar spine (T-score: -2.8 ± 0.4) and femoral neck (-2.6 ± 0.3) compared to SNRA (-2.2 ± 0.5 and -2.0 ± 0.4, respectively, $p < 0.05$).

• Inflammatory burden: SPRA had higher DAS28 scores (7.25 ± 0.99 vs. 6.78 ± 0.19, $p < 0.05$) and elevated CRP and ESR levels, correlating with greater bone loss.

• Quality of life: SNRA patients reported better HAQ scores (1.68 ± 0.08 vs. 1.92 ± 0.07 in SPRA, $p < 0.05$), reflecting less functional disability.

Conclusions:

Osteoporosis is a prevalent and severe comorbidity in RA, particularly in SPRA patients due to greater systemic inflammation and disease activity. Early OP screening and management are critical, especially in SPRA, to prevent fractures and improve patient outcomes. Enhanced diagnostic criteria for SNRA, combined with vigilant BMD monitoring, can mitigate long-term complications and optimize care for RA patients.

P233

TNFAIP3, TNFA, TNFAIP3, CTLA-4, BAFF, KCNS1 AND STAT4 POLYMORPHISMS ASSOCIATED WITH NON-RESPONSE IN RHEUMATOID ARTHRITIS PATIENTS SWITCHING BETWEEN BDMARDS AND JAKI

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Genetic single nucleotide polymorphisms (SNPs) may determine response to biologic disease-modifying antirheumatic drugs (bDMARDs) and Janus kinase inhibitors (JAKi) in rheumatoid arthritis (RA). The aim of this study was to determine the association between polymorphisms of TNFAIP3 (rs10499194), TNFA (rs1800629), CTLA-4 (rs231775), TNFSF13B (BAFF) (rs9514828), KCNS1 (rs734784) and STAT4 (rs7574865) genes and poor response to switching between bDMARDs and JAKi in RA patients who failed previous bDMARDs/JAKi.

Materials and Methods. The study group consisted of 94 patients with RA (85.1% female, 47.2 ± 13.8 years of age) with moderate/high activity (DAS28-CRP - 5.38 ± 0.90) in spite of bDMARD/JAKi therapy. All patients were switched to bDMARD/JAKi with different mechanisms of action, including 12 (12.8%) to TNFi, 27 (28.7%) to iIL-6, 46 (48.9%) to rituximab and 9 (9.6%) to JAKi. RA activity was assessed by DAS28-CRP, SDAI and CDAI indices after 6 months. Two groups were identified: responders (achievement of remission or low activity DAS28-CRP < 3.2, SDAI < 11, CDAI < 10) and non-responders (maintenance of moderate/high activity according to the indices). All patients underwent polymerase chain reaction genotyping for SNPs in the above genes.

Results. There were 47 (50%) patients each in the bDMARD/JAKi responder and non-responder groups. Carriers of the variant T (TT+CT) allele of the TNFAIP3 SNP (rs10499194) and the T (GT+TT) allele of STAT4 (rs7574865) independently increased the risk of non-response to bDMARDs/JAKi (TT+CT vs. CC: odds ratio (OR) =2. 84 [95% confidence interval (CI): 1.23-6.56]; p=0.013; OR=3.18 [95% CI: 1.36-7.46]; p=0.007, respectively). The presence of T minor alleles of the BAFF gene SNP (rs9514828) and the G (AG+GG) KCNS1 gene (rs734784) were independently associated with a reduced risk of treatment failure (CC vs. CT+TT: OR=0.25 [95% CI: 0.10-0.66]; p=0.004; OR=0.29 [95% CI: 0.12-0.74]; p=0.008, respectively). For the TNFA gene SNP (rs1800629) the multiplicative model (G vs A) was statistically significant (OR=3.12 [95% CI: 1.1-9.03] p=0.037), for the CTLA-4 gene (rs231775) the superdominant model (AA+GG vs AG: OR=2.6 [95% CI: 1.14-6.25] p=0.022).

Conclusions. The genes TNFAIP3 (rs10499194), BAFF (rs9514828), KCNS1 (rs734784) and STAT4 (rs7574865) were identified as four genetic predictors of treatment failure when switching between bDMARDs and JAKi.

***Keywords**: inefficiency, SNPs, gene, TNFAIP3 (rs10499194), TNFA (rs1800629), BAFF (rs9514828), KCNS1 (rs734784), STAT4 (rs7574865), bDMARDs, JAKi, switching.*

P234

CHARACTERISTICS OF RHEUMATOID ARTHRITIS PATIENTS WHO REQUIRE SWITCHING BETWEEN BDMARDS AND JAKI IN REAL CLINICAL PRACTICE

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The purpose of this study is to evaluate clinical features and pharmacotherapy in RA patients who needed bDMARDs/JAKi switching.

Materials and Methods. 103 patients with RA hospitalized to the Research Institute of Rheumatology (Moscow, Russia) were consecutively enrolled to this study. All patients met the ACR criteria for RA and required switching (changing bDMARDs or JAKi to another drug class) due to non-response, adverse events (AE), or intolerance. The majority were women – 85.4%, mean age 46.9±13.7 years, median of disease duration – 11.0 [6.0-16.5]. The examined patients were RF - positive - 78.6%, ACPA-positive - 71.8%, median SJC (swollen joint count)– 6.0 [4.0-9.0], PJC (painful joint count) – 11.0 [7.0-15.5], PtPGA (VAS) - 70,0 [60.0-80.0], PhPGA (VAS)

– 70.0 [60.0-70.0], CRP (mg/l) – 14.6 [4.05-33.15], ESR (mm/h) – 36 [14-64]. The inflammatory activity of RA was assessed using mean DAS28-ESR – 5.87±1.11, DAS28-CRP – 5.42±0.90, median CDAI - 32 [23.5-37.5] and SDAI – 32.5 [25.6-42.0] and corresponded to high disease activity. According to case histories 77.7% of patients used csDMARDs, more often methotrexate – 32.0% and leflunomide - 30.1%, less frequently sulfasalazine and hydroxychloroquine - 11.7% for each drug. The majority were taking glucocorticoids (GCs) – 62.1% and NSAIDs – 80.6%. At the time of inclusion to the study, all patients were switched to another therapy according to recommendation. Thus, rituximab was prescribed to 44.7%, iIL-6 - 30.1%, TNFi - 14.6%, JAKi - 9.6% and abatacept - 1%. Patients were divided into 3 groups: Group 1 - patients who required the first switch (n=50), Group 2 - second switch (n=39), Group 3 - ≥3 switches of bDMARDs/JAKi therapy.

Results. At the same time, PJC and PtPGA were significantly higher in groups 2 and 3. Patients in group 2 and 3, compared with group 1, showed a distinct trend to higher activity level on DAS28-ESR (P=0.052) and DAS28-CRP (P=0.057), and a significant difference on CDAI (P_{1-2}=0.01 and P_{1-3}=0.013) and SDAI (P_{1-2}=0.015 and P_{1-3}=0.011). Standard activity indices (DAS28, CDAI and SDAI) were higher in group 3 than in group 2, but this difference was not statistically significant (Figure 1). The frequency of AEs was significantly higher in group 3, compared with groups 1 and 2 (P1-3=0.027, P2-3=0.016). We analyzed therapy of bDMARDs/tsDMARDs for the period before hospitalization. Among all patients included to the study, 41 (39.8%) had previously used TNFi, 23 (22.3%) - JAKi, 17 (16.5%) - iIL-6, 11 (10.7%) - rituximab, and 11 (10.7%) - abatacept. In group 1, 50% of patients had previously used TNFi while there were no such patients in group 3 (p=0.003). In group 3, iIL-6 were more frequently used - 50% of patients versus 14.0% and 7.7% in groups 1 and 2, respectively (P1-3=0.006, P2-3=0.002). At the same time, new therapy after switch differed significantly. Most frequently prescribed for switch were rituximab, in 46 patients (44.7%) and iIL-6, in 31 patients (30.1%). Significantly less frequently - TNFi in 15 (14.6%) and JAKi in 10 (9.6%) patients.

Conclusion. The group of patients with repeated switching of bDMARDs/JAKi therapy was characterized by a higher PJC, higher PtPGA and disease activity indices (DAS28, CDAI and SDAI), than the group of patients with first switch of bDMARDs/JAKi. The most common bDMARDs for the first switch were TNFi, but for repeated switching (group 3) patients were no longer prescribed TNFi. iIL-6 and JAKi were most frequently used to continue treatment.

Keywords: *bDMARD, JAKi, switching,*

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OSTEOPOROSIS AND FRACTURES AMONG OLDER ADULTS IN THE MUNICIPAL HEALTH PROGRAM OF XOCHITEPEC, MORELOS, MEXICO

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Introduction: Osteoporosis is a disease characterized by decreased bone density. Factors such as age, sex, genetics, calcium and vitamin D deficiency, and lack of exercise contribute to its development.

Objective: To determine the prevalence of older adults with osteoporosis and their history of fractures.

Methodology: This was a cross-sectional descriptive study conducted among older adults in Xochitepec, Morelos, from August to December 2022. A non-probabilistic sample of 278 participants from the Municipal Comprehensive Care Program was used. After obtaining informed consent, data collection was conducted through a survey with validated and standardized instruments focused on geriatric syndromes, health habits, and nutritional status. Statistical analyses were performed using R software (version 4.4.2; R Core Team, 2025).

Results: A total of 278 older adults participated, with a mean age of 67.3 years and a standard deviation of 7.35 years. The prevalence of osteoporosis was 8.6%, of which 79.2% were women. Fifteen respondents did not answer. However, the association between osteoporosis and sex was not statistically significant (p-value = 0.3555 > 0.05). The most prevalent ages for osteoporosis were 62 and 63 years, with this variable showing statistical significance (p-value = 0.0193 < 0.05). Among older adults with osteoporosis, 29.2% reported experiencing fractures in the past year. Additionally, a statistically significant association was found between osteoporosis and type 2 diabetes (p-value = 4.204e-07 < 0.05).

Conclusion: The findings of this study justify the implementation of prevention strategies in the municipality of Xochitepec, Morelos. These interventions aim primarily to prevent fractures that negatively impact the quality of life of older adults.

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IDENTIFICATION OF NOVEL LOCUS ASSOCIATED WITH TRABECULAR BONE SCORE IN OLDER ADULTS: THE BUSHEHR ELDERLY HEALTH (BEH) PROGRAM

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Objective: This study aimed to identify genes related to Trabecular Bone Score (TBS) in the elderly population of Bushehr, a southern province of Iran.
Material and Methods: A Genome-Wide Association Study (GWAS) was performed on TBS in 2,071 participants of the Bushehr Elderly Health (BEH) program, a population-based cohort study. We investigated the association of more than 9.1 million Single Nucleotide Polymorphisms (SNPs) with the mean TBS of the lumbar spine from L1 to L4, using a Mixed Linear Model (MLM)-based GWAS. Adjustments were made for age, sex, and the first 10 principal components. The genotype data were analyzed using the GCTA version 1.91 and PLINK version 2.
Results: One locus on chromosome 2 (2p14) showed a statistically significant relationship with TBS L1-L4. There was a relationship between rs77405433-A on LINC02934, a long noncoding RNA, with TBS L1-L4 (β= -0.074, P= 4.9×10^{-9}).
Conclusion: One SNP of LINC02934 was associated with TBS. There is no direct evidence associating LINC02934 to bone health. Future studies could provide insights into its potential role in osteoporosis and bone quality.

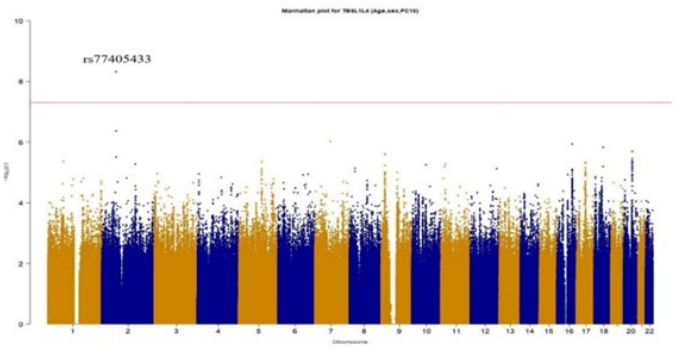

Fig. 1 Manhattan plot of the results from the GWAS of trabecular bone score L1-L4

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BONE MINERAL DENSITY IN CHILDREN WITH INFLAMMATORY BOWEL DISEASES

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Objective: To evaluate mineral bone density (BMD) in children with inflammatory bowel diseases.
Material and Methods: The study included 64 (34 girls, 30 boys) children with inflammatory bowel diseases aged 2 to 18 years (median age – 13.5 (11.1; 15.6) years) who were examined at the Republican Center for Pediatric Osteoporosis. Crohn's disease was detected in 38 of the examined patients, ulcerative colitis – in 26 patients. Total body less head (TBLH) BMD and lumbar spine (L1-L4) BMD were measured by means of Dual-energy X-ray absorptiometry (DXA). In accordance with the ISCD 2019 Pediatric Official Positions low bone mineral density for chronologic age was defined when BMD Z-scores were less than or equal to -2.0 SD.
Results: The median L1-L4 BMD in the cohort of examined patients was 0.644 (0.535; 0.812) g/cm^2, median TBLH BMD was 0.742 (0.656; 0.842) g/cm^2. The median BMD Z-score (L1-L4) was -1.3 (-2.3; -0.6) SD, median BMD Z-score (TBLH) was -0.6 (-1.2; 0.3) SD. Low BMD was registered in 34,3% (22/64) of children, including 14 patients with Crohn's disease and 8 patients with ulcerative colitis. BMD Z-scores from -1.9 to -1 SD were detected in 26,5% (17/64) of patients. Secondary osteoporosis in accordance with the ISCD 2019 Pediatric Official Positions was diagnosed in 7 of the examined patients due to the presence of vertebral fractures.
Conclusion: Low bone density was found in every third patient, and osteoporosis – in every ninth patient with inflammatory bowel disease. The obtained results determine the need to optimize measures to prevent bone mineralization disorders in children with Crohn's disease and ulcerative colitis.

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FEASIBILITY OF MEASURING CLINICALLY MEANINGFUL CHANGE IN FRAILTY USING THE FIT-FRAILTY APP ON A SLOW-PACED REHABILITATION UNIT

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Objective(s): Most frailty tools are discriminative however, there is a need for feasible, evaluative measures to understand treatment response. The Fit-Frailty App is a comprehensive assessment of frailty considering medical history, nutrition, function, psychosocial, cognition, and physical performance domains. An overall score is calculated using a frailty index with items validated in large cohorts including the Canadian MultiCentre Osteoporosis Study. This study aimed to evaluate the feasibility of measuring clinically meaningful change in frailty following slow-paced rehabilitation.
Material and Methods: We recruited a convenience sample of 52 older adults admitted to a slow-paced rehabilitation unit in Hamilton, Canada. Research assistants administered the Fit-Frailty App within 3 days after admission and 3 days before discharge. Feasibility outcomes were evaluated based on a framework adapted from Thabane et al. The threshold for clinically meaningful change proposed by Theou et al. is >0.03.
Results: Between March and September 2024, n=125 were admitted, n=62 were screened, and n=52 consented (58% female, mean age=80.1±8.9 years, mean length of stay=55.7±24.9 days). Fracture was the most common primary diagnosis (29%), and sarcopenia was highly prevalent (94%). The mean user experience rating was high (8.8±1.5 on a 10-point Likert scale). Clinically meaningful change in frailty scores was captured in 32 of the 40 who completed follow-up. Those who improved meaningfully were more likely to be discharged home (78%) compared to those who did not (38%).
Conclusion(s): The Fit-Frailty App can be feasibly implemented on slow-paced rehabilitation units to measure change in frailty. Monitoring treatment response may support successful discharges and prevention or management of related outcomes such as osteoporosis and fractures.
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USE AND CLINICAL PROFILE OF THE PATIENT UNDER TREATMENT WITH ROMOSOZUMAB

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Objective(s): Romosozumab is an anti-sclerostin monoclonal antibody recommended in patients with a high risk of fracture. The work analyzes the clinical profile, management and use of romosozumab in patients treated for any cause in an region of Spain.
Material and Methods: Retrospective observational study of all prescriptions made in Cantabria (591.481 population) (Spain) until January 2024, without exclusion criteria. Sociodemographic, risk factor, diagnostic and follow-up variables were collected.
Results: 33 subjects were analyzed, with a mean age of 68,39±14,1 years, 96.97% women (one male); As risk factors were found early menopause (21.2%), family history of fracture (18.2%), use of corticosteroids (18.2%), falls (12.1%), gait disorders (9.1%), tobacco (9.1%), dementia (6.1%). 12.1% of subjects had secondary osteoporosis, mainly hyperparathyroidism (6.1%), hyperthyroidism (3%) and hypogonadism (3%). 90.6% of the subjects had a previous diagnosis of osteoporosis. They had a vitD level of 38,66±8,1 ng/mL, and PTH of 83,3±41,5 pg/mL, 6.1% had poor digestive tolerance, 3% poor adhesion, 100% had polymedication, 2,78±1,8 subjects had vertebral fractures, non-vertebral fracture had 48.5%, mainly hip (24.2%). By diagnostic service, internal medicine (56,2%) and rheumatology (34,3%) are the most frequent and by follow-up, internal medicine (56.2%) and rheumatology (35.2%).
Conclusion(s): Romosozumab is used in patients with a very high risk of fractures, coinciding with what is recommended by clinical guidelines. The profile is a 68-year-old woman, on multiple medications with multiple vertebral fractures and other risk factors such as early menopause. Hip fracture is present in 25% of cases. The internist is the main initial prescriber and the one who does the most follow-up afterwards.

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TERIPARATIDE USE, WHO AND TO WHOM?

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Objective(s): Teriparatide is an osteoforming drug recommended for patients with a high risk of fracture. The work analyzes the clinical profile, management and use of teriparatide in patients treated for any cause in a region of Spain.
Material and Methods: Retrospective observational study of all prescriptions made in Cantabria (591.481 population) (Spain) during the year 2023, with no exclusion criteria. Sociodemographic, risk factor, diagnostic and follow-up variables were collected. Of the total of 618 patients, 1 in 9 was selected by simple random sampling.
Results: 66 subjects were analyzed, with an average age of 71.48±10.3 years, predominantly female (90.9%); 84.8% had a previous fracture, 71.2% had vertebral fracture (average of 2.71±1.7) and non-vertebral had 19.7%, mainly hip fracture (6.06%), being 45.5% of them in the last year; 90.9% had other risk factors (corticosteroids 21.2%, falls 18.2% (1.5±0.6 mean)). They had a vitD level of 28.38±10.4 ng/mL, and PTH level of 50.6±25.5 pg/mL. They had a poor drug tolerance 4.5%, poor adherence 6.1% and second osteoporosis 10.6%, mainly rheumatoid arthritis (57.1%). 84.8% of subjects had previously dexa (osteoporosis 67.9%, osteopenia 30.4%). They started treatment mainly in internal medicine (35.3%), rheumatology (35.3%) and primary care (16.7%).
Conclusion(s): Teriparatide is used in patients with a very high risk of fractures, coinciding with recommendations of clinical guidelines. The profile is a 70-year-old woman with multiple vertebral fractures and other bone risk factors. Hip fracture is present in 6% of cases. 4.5% presented poor tolerance. Only 67.9% presented osteoporosis in the densitometry. The internist and rheumatologist are the main initial prescribers.

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ANALYSIS OF ADHERENCE TO DENOSUMAB TREATMENT DURING THE COVID-19 PANDEMIC. WERE THERE DIFFERENCES BASED ON CONTRIBUTION TO THE COST OF THE DRUG?

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Objective(s): We aimed to analyze whether the SARS-CoV-2 pandemic has led to a decrease in Dmab adherence of the population based on contribution to the cost of the drug
Material and Methods: All patients who should have required the administration of a dose of Dmab in Cantabria (591481 population) (Spain), during the lockdown period (March to June 2020) were assessed. Sociodemographic variables, risk factors for osteoporosis, data on Dmab administration, and the reason for drug withdrawal were collected. Personal financial contribution to the price of the drug was classified as reduced (<40%) and normal (>40%)
Results: 2948 patients should have received a new dose of Dmab during the lockdown months, but 537 (18.2%) discontinued the drug. When analyzing the data on the withdrawal of denosumab from pharmacies, a decrease of 12.44% was observed in March compared to the same month of the previous year, -7.18% in April, -4.08% in May and +10.77% in June; this represents -12.93% in the study period from March to June. Table 1 contains general, clinical and sociodemographic variables of the non-compliant group. Significant differences were only found with respect to the existence of previous osteoporosis treatment and vertebral and non-vertebral fractures.

Table 1: Variables of the non-compliant group classified by contribution to the cost

		Normal contribution (n=65) %	Reduced contribution (n=472) %	Sig p<0,05
Age (years)		59.92±4.8	78.02±9.05	--
Sex (%)	Male	4.6	9.5	NS
	Female	95.4	90.5	
Secondary osteoporosis (%)		30.8	69.2	NS
Corticosteroid use (%)		12.3	12.9	NS
Cause of withdrawal (%)	Patient´s own decisión	69.2	64.4	--
	Postponed by nursing	20	13.6	--
	Physician	9.2	11.3	--
	Death	0	8.9	--
	Odontologist	1.5	1.9	--
Previous osteoporosis treatment (%)		35.4	51.5	p<0,05
Previous vertebral fracture (%)		12.3	34.8	p<0,05
Previous non-vertebral fracture (%)		15.4	28.4	p<0,05

Conclusion(s): There was a non-negligible percentage of patients who did not receive the dose of Dmab on time during the lockdown period. The main reason for withdrawal was the patient's own decision, It should be noted that the reduced contribution group, mostly retired, is older and therefore has more fractures and risk factors.

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PARTICULARITIES OF FRAILTY SYNDROME OF THE ELDERLY FROM THE REPUBLIC OF MOLDOVA

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The aim of the work was the evaluation of clinical and paraclinical particularities of frailty syndrome of the elderly from the Republic of Moldova.

Material and methods. The descriptive epidemiological study included 613 respondents (72.76±0.26 years), aged≥65 years, evaluated according to clinical examination, Complex Geriatric Assessment(CGA) - Katz, Lawton, Tinetti, MMSE, SGD, FS screening - Fried criteria, functionality - SPPB, Charlson Comorbidity Index(CCI), as well as laboratory investigations. The results were analyzed in Soft Statistica 7.

Results. The study data revealed the following results, according to FS screening criteria – frail elderly - 47.53%, pre-frail elderly - 29.39%, robust elderly - 23.07%; according to CGA the general group – Katz – 10.50±0.09, Lawton – 12.70±0.16, Tinetti – 20.62±0.27, MMSE – 25.14±0.16, DGS - 5.63±0.15, SPPB - 7.77±0.14 pt.; frail elderly group – Katz – 9.70±0.12, Lawton – 10.89±0.23, Tinetti – 17.56±0.36, MMSE – 24.09±0.20, DGS – 7.58±0.18, SPPB – 5.81±0.17, MNA – 21.56±0.21 pt.; pre-frail elderly group – Katz – 11.32±0.07, Lawton – 13.97±0.18, Tinetti – 22.22±0.31, MMSE – 25.67±0.23, DGS – 4.90 ±0.21, SPPB – 8.91±0.18, MNA – 24.49±0.20 pt.; robust elderly group – Katz – 11.22±0.18, Lawton – 14.96±0.17, Tinetti – 24.23±0.39, MMSE – 27.01±0.30, DGS – 2.13±0.21, SPPB - 7.77±0.14, MNA – 10.02±0.21 pt. According to CCI - general group – CCI - 4.22±0.08, CCI frail elderly group - 4.73±0.10, CCI pre-frail group – 3.91±0.11, CCI robust group – 3.64 ±0.17. In the general group, cardiovascular pathology - 96.25%, osteoarticular - 74.25% and digestive - 41.61% prevailed; for frail elderly group - osteoarticular - 89.21% and neurological 95.43% pathology; for pre-frail group - cardiovascular pathology – 97.31% and neurological – 96.64%; for robust elderly group - cardiovascular – 93.38% and neurological pathology – 91.73%. The laboratory parameters revealed: serum albumin – minimum value 23 g/l, creatinekinase - max. 347 U/L, 25-OH-Vitamin D value min. 4.98 ng/ml, parathormone max. 229 pg/ml, high-sensitivity PCR - 0.27-12.9 mg/L. Charlson mean values correlated with low autonomy - Katz(Rr=0.45; p<0.05), Lawton(r=-0.54; p<0.05), SPPB(r=-0.47 ; p<0.05), correlations were established between Charlson and Fried criteria: general weakness (Rr=0.31; p<0.05), reduced walking speed (Rr=0.49; p<0.05), weight loss (Rr=0.41; p<0.05).

Conclusions. The results of the study revealed the functional status as one of the most affected aspects against the background of the altered physical condition, such as the frailty syndrome.

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STUDY OF OSTEOSARCOPENIA CORRELATED WITH FRAILTY SYNDROME OF THE ELDERLY FROM THE REPUBLIC OF MOLDOVA

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Background. The aging process involves a series of age-related musculoskeletal physiological changes, which represent an important indicator of health status, with a significant impact on the autonomy of the elderly.

The purpose of the study was to evaluate the prevalence of osteosarcopenia and its association with the frailty syndrome in the elderly.

Material and Methods. The descriptive epidemiologic study included 613 elderly (73.16±0.24 years), who were examined according to clinical evaluation, laboratory and complex geriatric assessment (AGA). Based on the Fried Criteria, 3 comparable groups were formed: frail elderly - 304 (49.59%), pre-frail elderly - 177 (28.87%) and robust elderly - 132 (21.53%). Osteosarcopenia was diagnosed according to EWGSOP2 2018 criteria for sarcopenia and WHO criteria for osteoporosis.

Results. The weight of osteosarcopenia constituted 30.51% of patients from the general group, the highest was determined in the frail elderly - 47.37% vs pre-frail - 20.34% vs robust - 5.30% (p<0.05). A greater number of frail elderly, compared to pre-frail and robust, met the criteria for osteosarcopenia: SARC-F – 5.81±0.13 pt. vs. 3.81±0.15 pt. vs. 1.74±0.18 pt., p=0.001; dynamometry – 18.77±0.64 kg vs 17.72±0.76 kg vs 15.88±0.75 kg, p=0.003; MMT - 49.31±1.27 kg vs 53.23±1.62 kg vs 55.21±1.5 kg, p=0.001; physical performance SPPB – 5.80±0.16 pt. vs. 8.91±0.18 pt. vs. 10.02±0.21 pt., p=0.0001; T-score -2.61±0.06 DS vs 2.28±0.07 DS vs 1.51±0.79 DS, p=0.002. The prevalence of osteoporosis by study groups was higher for the frail elderly group 57.81%, then pre-frail 43.14% and robust 40.50%. The osteosarcopenia syndrome correlated with the severity of the frailty syndrome (r=0.50; p=0.05), with decreased autonomy (ADL, r=-0.59; p=0.05; IADL, r=-0, 63; p=0.05), presence of depression - DGS, r=0.42; p=0.05 and with MMSE cognitive disorders, r=-0.42; p=0.05. The value of 25-OH-Vitamin D per study group was: frail elderly – min value. 4.6 ng/ml, max. value 35.47 ng/ml; pre-frail elderly - min. value 4.98 ng/ml, max. value 60.59 ng/ml; robust elderly - value min. 20.17 ng/ml, max. value 86 ng/ml.

Conclusion. The osteosarcopenia syndrome was more frequently determined for frail elderly patients with a major impact on both autonomy - cognitive and emotional status.
Key-words: osteosarcopenia, frailty, elderly.

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EVALUATION OF FRAILTY SYNDROME ON THE BACKGROUND OF POLYPATHOLOGY IN THE ELDERLY FROM THE REPUBLIC OF MOLDOVA

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Background. The aging process involves a multitude of physiological changes determined by age, which may overlap with physiopathological ones, including polypathology.
The purpose of the study was to evaluate the impact of risk factors of frailty syndrome(FS).
Materials and methods. Descriptive epidemiological study included 613 elderly (73.16±0.24 years), who were examined according to clinical examination, laboratory and complex geriatric assessment (CGA) - Katz, Lawton, Tinetti, MMSE, DGS, FS screening - Criteria Fried, SPPB, multimorbidity – Charlson Comorbidity Index (CCI), nutritional status - MNA. Based on the Fried Criteria, 3 comparable groups were formed: frail elderly – 304 (49.59%), pre-frail – 177 (28.87%) and robust – 132 (21.53%).
Results. All the elderly included into the study had polypathologies. The study data revealed the following results, according to FS screening criteria: frail elderly - 47.53%, pre-frail elderly - 29.39% and robust elderly - 23.07%. According to the CGA, the frail elderly showed the lowest scores: Katz – 9.70±0.12, Lawton – 10.89±0.23, Tinetti – 17.56±0.36, MMSE – 24.09±0.20, DGS – 7.58±0.18, SPPB – 5.81±0.17, MNA – 21.56±0.21 pt., being followed by pre-frail and robust elderly with lower scores. The clinical examination data revealed the following pathologies, for frail elderly group it prevailed - osteoarticular pathology - 89.21% and neurological - 95.43%; pre-frail elderly group - cardiovascular pathology – 97.31%, neurological – 96.64% and osteoarticular pathology – 80.53%; robust elderly group – cardiovascular pathology – 93.38%, neurological – 91.73% and osteoarticular – 75.20%. The mean number of concomitant diseases was 4.62±0.12 diseases. According to CCI: CCI frail elderly group – 4.71±0.12, CCI pre-frail elderly group – 3.83±0.12, CCI robust elderly group – 3.57±0.18 pt. The frail elderly presented mainly low physical activity, fatigue, decreased walking speed, low weight. The administered treatment determined iatrogenic pathology 39.83% of cases. According to MNA - 40% of the participants were at risk of malnutrition, 22% were malnourished and 38% had a normal nutritional status (MNA - 21.20±0.24).
Conclusion. The results of the study highlight the impact of the frailty syndrome on the functional and clinical status of the elderly, revealing the prevalence of polypathologies, the increased risk of malnutrition and the deterioration of physical capacity.
Key-words: frailty syndrome, pathology, elderly.

P245

THE IMPACT OF ALBANIAN URBAN LYRIC MUSIC ON PATIENTS WITH OSTEOARTHRITIS OF THE VERTEBRAL COLUMN

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Background: Osteoarthritis of the vertebral column is a progressive degenerative disease that affects the middle age. Osteoarthritis of the vertebral column represents a significant degree of disability of these patients in their daily life.
Objective: To evaluate the effect of the Albanian urban lyric music on patients with osteoarthritis of the vertebral column.
Material and methods: 123 patients (86 women, 69.9% and 37 men, 30.08%) diagnosed with osteoarthritis of the vertebral column in stage 2-3-4 according to Thomson were included in the study. The average age of the group studied was 57±3.2 years. The assessment of the degree of pain was made according to VAS and the patients were assessed for their pain level at the beginning and end of the study. All patients were referred to listen to 30-45 minutes a day of Albanian urban lyric music by Albanian singers such as Tefta Tashko Koço, Marije Kraja, Jorgjie Truja and music from pianist Lola Gjoka, for 30 days. During the study period, the patients were not treated with painkillers or physiotherapy.
Results: VAS measured at the beginning of the study for the study group resulted mild (2-3) in 18 patients, moderate (5-6) in 75 patients and severe (7-8) in 30 patients. At the end of the study period (after 30 days) VAS resulted mild (1-2) in 59 patients (P=0.001), moderate (4-5) in 64 patients (P=0.001).
Conclusion: This study demonstrated the efficacy of the Albanian urban lyric music by these Albanian singers and pianist, on pain caused by degenerative osteoarthritis of the vertebral column. Albanian urban lyric music therapy in these patients improved motivation, availability and the approach to the experience of pain.

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DENOSUMAB FOR PAGET'S DISEASE: A SYSTEMATIC REVIEW ON A RENAL-FRIENDLY ALTERNATIVE

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Objective Review the literature addressing the use of denosumab (Dmab) for the treatment of Paget's disease of bone (PDB).
Material and Methods A systematic literature review was conducted using PubMed, SCOPUS and Web of Science databases until 30-11-2024. PICO criteria were Population - adult-onset PDB; Intervention - Dmab; Comparator (if any) – placebo or bisphosphonates (BP); Outcomes - reduction in alkaline phosphatase (ALP) levels and in pain, and treatment-related side effects. All types of studies were included.
Results After screening 123 articles, 12 were included. A total of 13 patients were found to have PDB and received Dmab. The patients' median age was 74 [40-91] years and 7 (53.8%) were male; 3 (23.1%) had associated Giant Cell Tumor (GCT-PDB). Eleven cases reported high ALP levels at baseline. Dmab regimen varied from 60-120mg SC every 3-12 months. In 6 cases, the choice of Dmab was related to renal impairment (Chícharo et al., 2024 [Abstract]; Eatz et al., 2022; Kostine et al., 2017; Kuthiah, 2018; Schwarz et al., 2012). Two patients received it after poor response or tolerance to BP (Farias & Zanchetta, 2014; Reid et al., 2016); and one other due to osteopenia, prior to PDB diagnosis (Kamalumpundi et al., 2023). In one case, the rationale for choosing Dmab was unclear (Pal & Bhadada, 2022). Regarding GCT-PDB, Dmab was administered after unsuccessful therapy with BP in 2 cases (Cosso et al., 2010; Tanaka et al., 2017) and concurrently with BP in the other case (Verma et al., 2016). Nine studies (10/13 patients) reported a reduction in ALP. In isolated PDB cases, the mean ALP reduction was 60.7% (±22.7) after a median of 3 months (IQR 5). In patients with PDB-GCT, reduction in tumor size was described in all patients after a median of 2.5 months (IQR 5.5). Out of the 12 patients that had symptomatic pagetic lesions, 11 (91.7%) experienced pain improvement. Hypocalcemia was reported in 3 (23.1%) patients, with 1 case requiring ICU admission (Kostine et al., 2017).
Conclusion Dmab demonstrated a favorable safety and efficacy profile in the treatment of PDB. It seems a reasonable therapeutic option for those who have a formal contraindication to BP or in GCT-PDB. This data displays an unmet need for guidelines addressing treatment of PDB in patients with CKD.

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PAGET'S DISEASE OF BONE: CLINICAL AND EPIDEMIOLOGICAL CHARACTERIZATION OF THE POPULATION OF A PORTUGUESE TERTIARY CENTER

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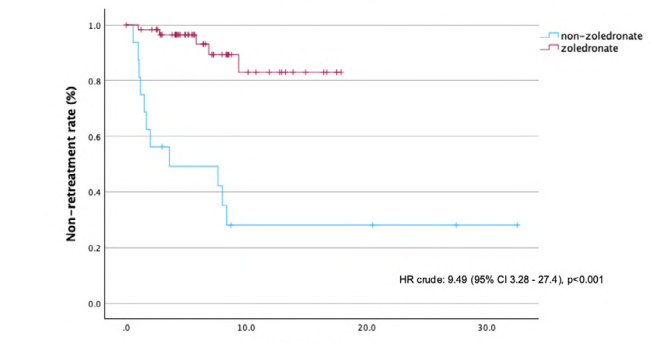
Objectives To characterize the clinical and demographic profile of a Paget's Disease of Bone (PDB) cohort.
Material and Methods Retrospective observational study of 80 PDB patients.
Results Most patients were female and born in rural areas. Diagnosis was between 1974 and 2021, with a mean age of 63±12 years. Eleven patients had PDB family history. The bones most affected were pelvis (75%), sacrum (25%) and femur (25%). Polyostotic disease was present in 51% of patients and associated with higher baseline alkaline phosphatase (ALP, U/L) (200 [167] vs 149 [124], p=0.035), P1NP (ng/mL) (196 [188] vs 115 [76], p=0.015) and CTx (ng/mL) (0.7±0.3 vs 0.6 [0.3], p=0.031). Polyostotic patients had a higher frequency of skull (22% vs 3%, p=0.029), pelvis (88% vs 62%, p=0.007), vertebrae (37% vs 5%, p<0.001), femur (39% vs 11%, p=0.003), and sacrum (37% vs 13%, p=0.014) involvement. In multivariate analysis, affection of vertebrae (OR 279 [10-7671], p<0.001), femur (OR 151 [7-3132], p=0.001), pelvis (OR 101 [7-1432], p<0.001), sacrum (OR 62 [5-738], p=0.001) and skull (OR 48 [1-2056], p=0.044) were associated with polyostotic PDB. First line treatment was zoledronate (ZOL) in 75% of patients, followed by pamidronate (10%), alendronate (5%), calcitonin (4%), risedronate and denosumab (1.3%). Three patients did not undergo treatment and 13 were treated with ≥2 drugs. ZOL was the most used drug (89%). We observed a reduction in the number of patients with elevated ALP (p=0.002) and in the value of ALP, P1NP and CTx (p<0.001) between baseline and 6-12 months after last treatment. Sixteen patients underwent retreatment. Mean drug survival of first treatment with ZOL was 16 years (95% CI 14-18) and 12 years (95% CI 5-18) in the group treated with another drug (Figure 1). Drug survival was significantly lower in the latter, with a higher rate of retreatment (crude HR 9.49 (95% CI 3-27); log-rank p<0.001). When adjusted for age at diagnosis, smoking, baseline ALP and calcium levels, first line treatment with a drug other than ZOL remained associated with lower drug survival (adjusted HR 10.10 (95% CI 2-48); p=0.004).
Conclusion This is the largest Portuguese PDB cohort, noting high prevalence in rural areas and high biochemical remission rates after treatment. ZOL first-line therapy was associated with higher drug survival and lower retreatments rates.

Figure 1 - Drug survival curve of first treatment in patients treated with ZOL (zoledronate) as first line and in patients treated with other drugs other than ZOL as first line (non-zoledronate)



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OSTEOPOROSIS RELATED TO ZINC DEFICIENCY IN ACRODERMATITIS ENTEROPATHICA – A RARE MANIFESTATION OF A RARE DISORDER?

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Objectives To present the case of a young female with acrodermatitis enteropathica (AD) and early onset osteoporosis related to zinc deficiency and to highlight the importance of these nutrient in bone metabolism.

Material and methods AD is an autosomal recessive disease resulting from a mutation in the gene SLC39A4 on chromosome 8q24.3 which encodes the zinc transporter. This mutation impairs zinc absorption in the gastrointestinal tract. Zinc is fundamental in several processes, particularly in bone health, where it prevents bone resorption and stimulates bone formation. [1]

AD usually manifests in early childhood as a scaly erythematous rash (usually in perioral and anogenital areas), alopecia and diarrhea amongst other symptoms.

Treatment consists of lifelong zinc supplementation which is expected to resolve the mentioned manifestations. However, frequent monitoring and zinc dose adjustments, particularly in certain periods of physiological stress (such as pregnancy), might be necessary. [2]

Results Here we present a case of a 34-year-old female patient who was diagnosed with AD during childhood, when she begun zinc supplementation with complete resolution of clinical symptoms. During adulthood she lost follow-up and zinc levels were not monitored, despite maintaining supplementation.

After her first pregnancy at the age of 24, she started complaining of progressive dorsal and lumbar pain. Bone densitometry (at 34 years old) revealed a Z-score of -2.4 at the lumbar spine and -0.8 at the femoral neck. CT scan of dorsal and lumbar spine showed loss of height in multiple vertebral bodies from D6-D11, particularly in D9 with a loss greater than 30%. The patient had no other risk factors that justified early onset osteoporosis, therefore, it was presumed to be related to zinc deficiency with suboptimal monitoring of zinc levels throughout adult life.

Conclusion Zinc deficiency needs to be considered in young patients with early onset osteoporosis without other risk factors.

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REAL-WORLD EFFECTIVENESS OF ANTI-RESORPTIVE AGENTS ON TRABECULAR BONE SCORE IN PATIENTS WITH EARLY BREAST CANCER UNDERGOING AROMATASE INHIBITORS

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Objective: Anti-resorptive agents, including denosumab and bisphosphonates, are effective in managing aromatase inhibitor (AI)-induced bone loss in patients with breast cancer. This study aimed to evaluate the real-world effectiveness of denosumab and bisphosphonates on bone quality, assessed by the lumbar spine trabecular bone score (TBS).

Methods: This retrospective study included 161 patients with early breast cancer undergoing AI therapy between December 2018 and November 2024. Patients were treated with either denosumab (n=96) or bisphosphonates (n=65). Bone mineral density (BMD) at the lumbar spine (L1–L4), femoral neck, and total hip, as well as lumbar spine TBS, were measured at baseline and after 12 months of treatment.

Results: The mean age of the patients was 62.8 ± 7.3 years, and the mean body mass index was 23.4 ± 3.3 kg/m², with no significant differences between the denosumab and bisphosphonate groups (P=0.366 and P=0.342, respectively). The median time interval from AI initiation to the start of anti-resorptive therapy was 14.9 months (interquartile range 8.9 -30.0 months), which was comparable between the two groups (P=0.882). Baseline BMD at the lumbar spine, femoral neck, and total hip, as well as TBS, were similar between the two groups (all P>0.05). After 12 months of treatment, lumbar spine BMD increased by 6.65 ± 6.49% in the denosumab group and 3.57 ± 5.01% in the bisphosphonate group. Denosumab showed greater efficacy in improving lumbar spine BMD (P<0.001). Femoral neck BMD increased by 3.57 ± 5.54% with denosumab and 1.58 ± 3.69% with bisphosphonates, with denosumab demonstrating superior efficacy (P=0.007). Additionally, denosumab showed better efficacy for improving total hip BMD than bisphosphonates (3.12 ± 5.61% vs. 1.11 ± 5.20%; P=0.035). Changes in lumbar spine TBS after 12 months were 1.64 ± 3.98% in the denosumab group and 0.67 ± 4.25% in the bisphosphonate group, with no statistically significant differences between the two groups (P=0.140).

Conclusion: Both denosumab and bisphosphonates may increase BMD in patients with early breast cancer undergoing AI therapy, with denosumab demonstrating superior efficacy. Additionally, both agents help maintain stable TBS over 12 months, mitigating the negative effects of AIs on bone quality.

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ASSOCIATION OF GENETIC MARKERS WITH CLINICAL AND LABORATORY INDICATORS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Rheumatoid arthritis (RA) is a multifactorial disease influenced by both genetic and environmental factors. Identifying individual genetic predictors of increased risk for RA complications, such as osteopenia and osteoporosis, can enable treatment adjustments and reduce adverse effects.

Objective: This study aimed to identify the most significant polymorphic variants of genes associated with clinical and biochemical indicators in patients with RA, particularly focusing on the prediction of complications such as osteopenia and osteoporosis.

Material and Methods: The study included 262 participants, comprising 128 healthy controls and 176 patients diagnosed with RA. All participants underwent outpatient examination at the 1st Minsk City Hospital, Belarus, after providing informed consent. Clinical data collection involved medical history analysis, anthropometric measurements, and assessment of systemic manifestations. Bone mineral density (BMD) was evaluated using dual-energy X-ray absorptiometry (DEXA). Genetic analysis targeted polymorphisms in the following genes: IL19 (rs587776843), ATIC (rs4673993, rs2372536), ABCB1 (rs1128503, rs1045642), ABCG2 (rs2231142), AMPD1 (rs17602729), ITPA (rs1127354), ADORA2A (rs5760410, rs2236624), TLR4 (rs4986790), HLA-E (rs1264457), NR3C1 (rs258751), ATP5F1E (rs1059150), KLRD1 (rs2302489), GLCCI1 (rs37973), CRHR1 (rs1876828), ESR1 (rs1801132), PRL (rs7739889), IL6 (rs1800795), and CALCR (rs1801197). Genotyping was performed via real-time polymerase chain reaction (PCR).

Results: The genotyping revealed significant associations of specific gene variants with decreased BMD and susceptibility to RA. Key findings include:

- The *ESR1* rs1801132 C/C genotype was significantly associated with reduced femoral neck BMD in RA patients (0.76±0.01) compared to controls (1.02±0.01, p=0.048).
- The *PRL* rs7739889 A/A genotype was linked to lower femoral neck BMD in patients (0.77±0.02) compared to controls (1.12±0.13, p=0.033).
- Similar associations were observed for the *CALCR* rs1801197 A/A and *IL6* rs1800795 C/C genotypes, with femoral neck BMD values of 0.76±0.01 and 0.77±0.02, respectively, in patients, versus 1.03±0.02 in controls (p=0.025 and p=0.038).
- Polymorphisms in *TLR4* (rs4986790), *HLA-E* (rs1264457), and *IL19* (rs587776843) were significantly associated with an increased risk of RA development.

Conclusion: The study demonstrates that genetic markers such as *ESR1* rs1801132, *PRL* rs7739889, *CALCR* rs1801197, and *IL6* rs1800795 are associated with decreased BMD in RA patients. Additionally, polymorphisms in *TLR4*, *HLA-E*, and *IL19* are linked to RA susceptibility. These findings highlight the potential of genetic profiling to enhance personalized medicine approaches in the prevention and management of RA and its complications.

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A CASE REPORT OF BLAU SYNDROME

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Introduction: Blau syndrome (BS) is a rare autosomal dominant, auto inflammatory granulomatous disease, which is caused by a gain-of-function mutation in the Nucleotide Binding Oligomerization Domain Containing 2 (NOD2) gene. Clinical manifestations of BS develop in early childhood, and are characterized with the triad of arthritis, uveitis and dermatitis; however, patients with BS do not necessary have all of these three manifestations in their lifetime.

Case description: Patient K, female, born in 1980. Upon admission in 2024, she complained of pain and swelling in the knee joints, subfebrile temperature, deformation and limited movement in the small joints of the hands, feet, and contractures of the elbow joints (fig.1). She was 3 years of age when she developed arthritis mainly targeting both ankles. Later, the joint syndrome progressed with involvement of the joints of the feet, hands, knees and wrists. The disease had a wave-like character; periods of exacerbation were accompanied by severe stiffness and fever. She was diagnosed with Juvenile idiopathic arthritis and was treated with glucocorticoids, NSAIDS, sulfasalazine. In adulthood, she is seen by a rheumatologist with a diagnosis of seronegative rheumatoid arthritis and receives methotrexate. In 2009 at the age of 29 she gave birth to a son. The boy was 1 year of life when he developed skin rash, fever and later polyarthritis and bilateral uveitis. In 2018 attention was drawn to the characteristics of the patient's arthritis, early onset, concomitant manifestations (skin rash, uveitis), the absence of a significant increase in acute phase markers throughout all years of observation, as well as the characteristics of joint damage in the mother. Upon further examination, a mutation in the NOD2 gene was detected in the mother and son. Blau syndrome was diagnosed, methotrexate therapy was prescribed. However, the patient developed severe deformities (fig. 2).

Discussion: BS is a very rare disease, which should be considered in the differential diagnosis of childhood arthritis and uveitis. Timely diagnosis including genetic analysis is necessary to prescribe therapy such as immunosuppressants and biologics.

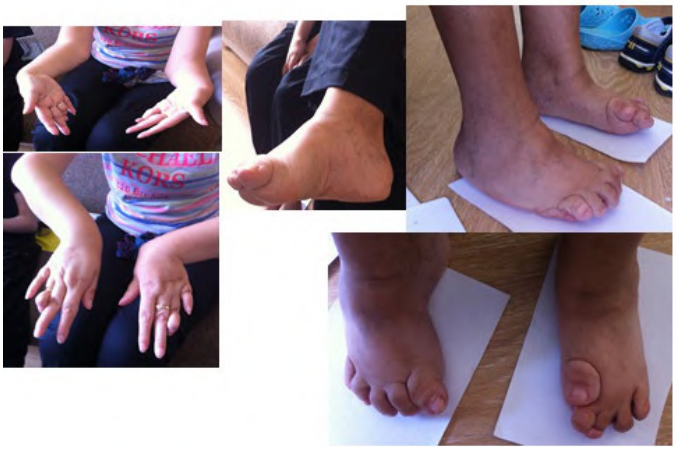

fig 1

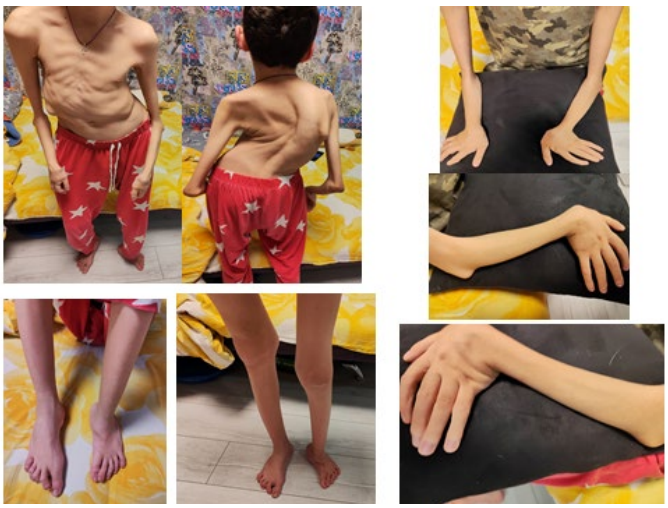

fig 2

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OSTEOMETABOLIC PROFILE OF PRIMARY HYPERPARATHYROIDISM: PRELIMINARY RESULTS OF A MONOCENTRIC RETROSPECTIVE STUDY

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Primary Hyperparathyroidism (PHPT) is an endocrine disorder which has a high impact on the osteoarticular system.
Objective To describe clinical, biochemical and osteometabolic features of patients affected by primary hyperparathyroidism evaluated in Endocrinological Outpatient of a Secondary Centre and to explore the main differences between fragility fractured and not fractured patients.
Methods Clinical, laboratory and radiological data of patients with PHPT evaluated from January 2023 to December 2024 were obtained by reviewing medical records.
RESULTS
A total of 103 patients (Mean Age 65.5 ± 11.5, Female 81.5%, Male 18.5%), were enrolled in this study. At the time of presentation 24 (23.3%) had nefrolitiasis, 49 (47.5%) were affected by osteoporosis, 32 (31 %) by osteopenia, and 27 (26.2%) reported in clinical hystory almost one fragility bone fracture (verterbral, femoral, non vertebral non femoral). 28 patients (27.1%) fell into normocalcemic while 75 (72.9%) into hypercalcemic primary hyperparathyroidism. We divided the patients into two groups : group 1 with fragility fractures and group 2 without fragility fractures. The mean BMI of group 1 was 23.2 ± 4.2 kg/m^2, whereas group 2 was 25.4 ± 4.3 kg/m^2 ($p<0.05$). In group 1 the percent of patients with Bone Mineral Density (BMD) in osteoporosis range was significantly higher for all sites than group 2 (Vertebral = 56.5% vs 33.3 %, Total Femur 47.8% vs 13.1%, Femoral Neck 50% vs 20.9 % , $p < 0.05$). Group 1 and Group 2 had comparable median calcium corrected for albumin (10.6-IQR 0.9 vs 11.06-IQR 1.38 mg/dl), mean phosphate (2.82 ± 0.07 vs 2.64 ± 0.05 mg/dl), median PTH (101; IQR 75 vs 141; IQR 94.4 pg/ml) and mean vitamin D (30.03 ± 9.78 vs 27.05 ± 10.2 ng/ml) level at presentation.
Conclusion In this our preliminary study fractured PHPT patients presented at a lower BMI than non fractured ones. Patients with fracture showed BMD in the range of osteoporosis in a significantly higher percentage than patients without fracture at all measured sites. There was no statistical difference in PTH, calcium corrected for albumin, phosphate and vitamin D levels, percent of patients with nephrolitiasis and normocalcemic profile between the two groups.

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MINERAL METABOLISM COMPENSATION AND FRAGILITY FRACTURES IN POST-SURGICAL HYPOPARATHYROIDISM: A CROSS-SECTIONAL STUDY

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INTRODUCTION
Permanent post-surgical hypoparathyroidism is a complication of thyroidectomy (about 3%) characterized by reduced calcium levels due to inadequate PTH production. The treatment is based on calcium salts and active vitamin D integration and the adequate control of mineral compensation is essential to avoid osteometabolic complications. The disease's impact on fracture risk has yet to be determined and published data are still inconsistent (1).
OBIECTIVE
To describe the cohort of patients with postsurgical hypoparathyroidism in a 6-year observation period (from January 2017 to December 2022) and the distribution of fragility fractures in relation to the functional profile of mineral metabolism and therapy at the latest clinical evaluation available.
METHODS
103 patients (Age at diagnosis 49.1 ± 15.5 years, F = 78.6%, M= 21.4%) were enrolled in the study and data on body mass index (BMI), therapy, fragility fracture's history and mineral metabolism

(total and corrected for albumin calcium, phosphate, creatinine, 25-OH vitamin D, PTH, TSH) at the latest evaluation were collected. The patients were divided in 2 groups: Group 1 with fragility fractures and Group 2 without fragility fractures.

RESULTS

88 patients (85.4%) were taking calcium salts, 98 (95.1 %) were taking vitamin D active analogues. 14 patients (13.6 %) reported fragility fractures (vertebral, femoral, non vertebral non femoral). The comparison between the two groups showed that patients with fractures had higher calcium-phosphate product values (38.4 ± 4.94 vs 33.7 ± 5.7 mg^2/dl^2, p= 0.006) and higher phosphate values (4.50 ± 0.77 vs 3.90 ± 0.70 mg/dl , p= 0.012). No differences were found for all the other parameters analysed.

CONCLUSION

In our population, although with the limitations of a retrospective study, fractured patients with post-surgical hypoparathyrodism have a worse mineral metabolism than the unfractured ones, in particular higher levels of phosphate and, consequently, higher levels of calcium-phosphate product.

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PRP THERAPY IN OA KNEE- MY EXPERIENCE (A SERIES OF 490 CASES – 545 KNEES)

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ABSTRACT

PRP THERAPY IN OA knee- MY EXPERIENCE (A series of 490 cases – 545 KNEES)

INTRODUCTION

Osteoarthritis (OA) is a major source of disability, pain, and economic burden worldwide. Genetic, biochemical, and mechanical factors are responsible for the complex multifactorial epidemiology of the disease. Abnormal joint biomechanics, age, gender, joint injury, and high body mass index (BMI), along with a strong genetic basis, are associated with OA development. Presently, OA is the eighth-most common disease in males world over and the fourth most common disease in females [1].

Previously, OA was believed to be caused by the mechanical degradation of cartilage. But now the understanding is , this a complex of , mechanical, chemo- inflammatory , the pathophysiology is complex inter play leading to the production of matrix metalloproteinases (MMPs), nitric oxide (NO), and prostaglandins (PGs), leading to matrix degradation [2]. The catabolic effects of interleukins secreted by chondrocytes, mononuclear cells, osteoblasts, and synovial cells interfere with the activity of growth factors and reduce the synthesis of aggrecan, which is the key constituent of the matrix providing resilience to cartilage [3]. Interleukin-1β (IL-1β), the pro inflammatory cytokine, is a major protagonist in inducing arthritic changes, as evident by its increased levels in the synovial fluid of affected joints [4-5].

Intra-articular injection of platelet-rich plasma (PRP) has been broadly considered for cartilage repair, as it could enhance matrix synthesis thanks to the properties of its growth factors (mostly platelet-derived growth factor (PDGF) and transforming growth factor-beta (TGF-beta) [6-8].To evaluate the efficacy of PRP intra-articular injections in OA knee patients . A series of 123 patients with different grade of OA. Assessing the recovery on VAS and WOMAC scale.

Methodology

08ml of patient's blood taken in two tubes containing 0.5 ml of Sodium Citrate (38%w/l). Centrifuged at the 4000 rpm for 20 min. Let sample rest for about 5 minutes, about 05 to06 ml of PRP is extracted. Patient shifted to operation theatre. After proper skin sterilisation and knee draping. This PRP is injected into the knee joint. 2nd injection of PRP repeated after one month. For the last 250 patients augmented with Sodium hyaluronate Injection (30mg /2ml). The patient's progress is assessed after the second injection. First case done 5yrs. Back and last case included 6month back(today-11.05.2024) . Recovery assessed with VAS and WOMAC scale. Four aspects of WOMAC sore taken into consideration – 1) Pain at night, 2) rising from sitting, 3)walking on flat surface, , 4) performing light domestic duties

Results

In the series of 490 cases – 545 KNEES taking into consideration the severity of OA as per K& J classification - Grade 2 (minimal) moderate joint reduction, Grade 3 (moderate) severe joint space reduction with sub chondral sclerosis, Grade 4 (severe) large osteophytes, marked narrowing of joint space, severe sclerosis and definite deformity of bone ends. BMI of the patient, age of the patient showed– 1) Pain at night- 85 to 100%, 2) rising from sitting 86 to 100%, 3) walking on flat surface 85 to 95%, 4) performing light domestic duties70 to 96%, across various Grade of OA (Grade 2 to 4). Patients were also instructed for regular exercises to strengthen their thigh muscles and life style changes to bring their body weight in permissible levels as per their height.

Conclusion

PRP therapy in moderate to severe OA knee showed good to excellent results in improving pain during rest, pain free walk, climbing stairs. Patients who do not want TKR is worth trying. Up to 5yrs follow patients are happy and pain free.

KEY WORDS.

Osteoarthritis, body mass index (BMI),matrix metalloproteinases (MMPs), nitric oxide (NO), and prostaglandins (PGs), interleukins, chondrocytes, mononuclear cells, osteoblasts, and synovial cells growth , aggrecan, Interleukin-1β (IL-1β), the proinflammatory cytokine,Intra-articular injection of platelet-rich plasma (PRP),platelet-derived growth factor (PDGF), transforming growth factor-beta (TGF-beta), PRP intra-articular injections in OA knee patient,grade of OA, WOMAC score,Arthrex PRP harvesting special syringe

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ESTROGEN RECEPTOR SIGNALING MODULATES NEURO-OSTEOGENIC AXIS FOR OSTEOPOROSIS SUPPRESSION

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Background
Estrogen-deficiency-induced postmenopausal osteoporosis is a bone-related disease characterized by reduced bone quality and strength, resulting in increased bone fragility among the aged population. Osteoporotic fractures continue to pose a significant socioeconomic burden on healthcare systems and patients. Estrogen receptor signaling plays a crucial role in the development of estrogen-deficiency-associated osteoporosis. Estrogen receptors ERα, ERβ, and GPR30 are significantly expressed by osteoblasts and osteocytes bone cells. The subsequent activation of these receptors by estrogenic stimuli modulates estrogen receptor signaling which helps maintain bone health. Femur bones are densely innervated by sensory nerves that release neurotrophic factors that play a critical role in maintaining bone homeostasis. Even though estrogen receptor signaling and sensory nerve activities promote bone formation it is unclear whether estrogenic modulation of sensory nerves on long bones influences bone formation in normal and osteoporosis conditions.
Objective: The current study assessed how estrogen receptor (ERα) signaling modulation could enhance peripheral sensory functions to suppress osteoporosis development.
Method: In this study, an ovariectomy(OVX)-induced osteoporosis model was established in C57BL/6N female mice aged 8-10 weeks. The experimental groups were sham control, OVX control, and 30μg/Kg Estradiol (E2). All mice received intraperitoneal injections three times per week for 4 weeks. Micro-computed (μCT) scan was taken before the ovariectomy and weekly after the ovariectomy to assess bone growth.
Results: The Estradiol treatment significantly suppressed osteoporosis development by improving bone mineral density (BMD), trabecular thickness (Tb.th), and number (Tb.N) in comparison with the OVX control group. The estradiol treatment also significantly increased the expression of osteogenic markers OCN, ALP, and RUNX2. Interestingly, the estradiol treatment also upregulated the co-expression of the estrogen receptor alpha (ERa), GAP43, and MAP2 neuronal markers on the periosteum of the femur bones.
Conclusion: The activation of estrogen receptor alpha (ERα) by estradiol in periosteal sensory nerves can enhance positive neuro-osteogenic modulation to trigger new bone formation and anti-osteoporosis activity in OVX mice. Thus, targeting estrogen receptor signaling for improved neuro-osteogenic activities can serve as a new therapeutic strategy for osteoporosis prevention.

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IMPACT OF GENDER-AFFIRMING HORMONE THERAPY ON PATIENTS WITH GENDER DYSPHORIA: A CASE SERIES

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Objective: To describe changes in bone mineral density in a gender dysphoric population receiving gender affirmation therapy. Materials and Methods: This case series included seven transgender individuals (three FTM, four MTF) who initiated GAHT at our endocrinology clinic. BMD measurements (lumbar spine, femoral neck, total hip) were obtained using dual-energy X-ray absorptiometry (DXA) at baseline and after one year of GAHT. Descriptive statistics were used to analyze the data.
Results : We describe changes in bone mineral density in 7 transgender patients . Three of the 7 patients were transgender men (female to male FTM) and 4 were transgender women (male to female MTF). The entire population received gender-affirming hormone therapy over a one-year period. The average age in the FTM group was 49 years, and in the MTF group, 47 years. FTM Group: Lumbar spine BMD: Baseline: 1.176 g/cm2, One-year: 1.198 g/cm2,Femoral neck BMD: Baseline: 0.883 g/cm2, One-year: 0.892 g/cm2, Total hip BMD: Baseline: 0.973 g/cm2, One-year: 0.975 g/cm2. MTF Group: Lumbar spine BMD: Baseline: 1.510 g/cm2, One-year: 1.110 g/cm2, Femoral neck BMD: Baseline: 0.936 g/cm2, One-year: 1.013 g/cm2. Total hip BMD: Baseline: 0.948 g/cm2, One-year: 0.962 g/cm2. The FTM group demonstrated a

slight increase in BMD at all sites over the one-year follow-up period. In contrast, the MTF group exhibited significant variability, with some individuals experiencing BMD loss.
Conclusion: This case series provides preliminary data on the impact of GAHT therapy on bone mineral density in transgender individuals. While the FTM group demonstrated a slight increase in bone mineral density, the MTF group showed significant variability in patients who were not adherent to therapy. These findings emphasize the importance of ongoing bone health monitoring in transgender individuals receiving GAHT therapy, particularly in the MTF population. Further research with larger sample sizes and longitudinal follow-up is critical to fully understand the long-term effects of GAHT therapy on bone health and to develop appropriate strategies to optimize bone health outcomes in this population.
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P257
LOW BONE MINERAL DENSITY IN FERTILE WOMEN AND YOUNG MEN WITH SYSTEMIC SCLEROSIS

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Objective(s): to study the frequency of low bone mineral density (BMD) and factors affecting it in fertile women and men < 50 years with systemic sclerosis (SSc)
Material and Methods: The study included 84 patients with SSc according to the criteria of ACR/EULAR 2013: 68 (81.0 %) fertile women and 16 (19.0 %) men under the age of 50 (median age - 37.0 [32.0; 44.0] years). BMD was measured at lumbar spine, femoral neck and total hip by dual energy X-ray absorptiometry (DXA). Low BMD was diagnosed if the Z-score was less than -2.0 SD. To identify the factors associated with low BMD, a logistic regression analysis was performed.
Results: 17 (20.2 %) patients had low BMD, including 14 (20.5%) women and 3 (18.8 %) man. Univariate logistic regression revealed that low BMD was associated with duration of SSc (OR 1.12; 95% CI [1.02; 1.23]; p = 0.013), joint contractures (OR 3.44; 95% CI [1,05; 11,29], p = 0,039), duration of glucocorticoids (GCs) taking (OR 1.18; 95% CI [1.06; 1.32], p = 0.003) and cumulative dose of GCs (OR 1.07; 95% CI [1.03; 1.12], p = 0.002), body mass index (BMI) < 25 kg/m^2 (OR 6.85; 95% CI [1.41; 33.29], p = 0.017). Multivariate analysis demonstrated the association between low BMD and BMI < 25 kg/m^2 (OR 6.68; 95% CI [1.27; 35.17], p = 0.025), duration of SSc (OR 1,13 95% CI [1,02; 1,26], p = 0,018) in young patients with SSc.
Conclusion(s): 20.2% of young patients with SSc had low BMD, which was associated with BMI and disease duration.

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FACTORS AFFECTING BONE MINERAL DENSITY IN PATIENTS WITH SYSTEMIC SCLEROSIS

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Objective(s): To study the frequency of osteoporosis (OP) and related factors in patients with systemic sclerosis (SSc).
Material and Methods: 200 patients with SSc (median age 52.0 [40.0; 63.0] years) were included: 160 (80.0%) women and 40 (20.0%) men. BMD was measured by DXA. In postmenopausal women and men ≥ 50 years OP was diagnosed with T- score at any region ≤ -2.5 SD, in fertile women and men < 50 years - with Z-score <-2.0 SD. To identify the factors associated with OP, a logistic regression analysis was performed.
Results: OP was detected in 62 (31.0%) persons. In univariate analysis the presence of OP was associated with age, duration of SSc, duration of proton pump inhibitor use, joint contractures, acroosteolysis, low diffusing capacity of the lung for carbon monoxide, interstitial lung disease, glucocorticoids (GCs) use > 3 months, GCs cumulative dose, current dose of GCs, duration of GCs taking, anti-topoisomerase I positivity, body mass index (BMI) < 24 kg/m^2, female gender. Multivariate analysis confirmed association between OP and BMI < 24 kg/m^2 (OR 2.86 95% CI [1.49; 5.49], p = 0.001), age (OR 1,05; 95% CI [1,02; 1,07], p < 0.001), duration of SSc (OR 1.07; 95% CI [1.02; 1.11]; p = 0.004), joint contractures (OR 2,08; 95% CI [1,03; 4,19], p = 0,040) and anti-topoisomerase I positivity (OR 2,23; 95% CI [1,13; 4,39], p = 0,019).
Conclusion(s): 31% of examined patients with SSc had OP. BMI < 24 kg/m^2, age, duration of SSc, joint contractures and anti-topoisomerase I positivity increased the risk of OP.

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RISK FACTORS OF FRAGILITY FRACTURES IN PATIENTS WITH SYSTEMIC SCLEROSIS

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Objective(s): to evaluate the frequency and factors associated with of fragility fractures in patients with systemic sclerosis (SSc)
Material and Methods: 200 patients (80,0% women; median age - 52.0 [40.0; 63.0] years) with SSc according to the criteria of ACR/EULAR 2013 were included. The history of low-energy nonvertebral fractures and vertebral fractures according to spine X-ray morphometry was assessed. To identify the factors associated with fragility fractures, a logistic regression analysis was performed.
Results: 42 (21%) patients had fragility fractures: 18 (9.0%) - ver-

tebral and 24 (12.0%) - nonvertebral fractures. Univariate analysis revealed the association between fragility fractures and age (OR 1.08; 95% CI [1.05; 1.11], p < 0.001), duration of SSc (OR 1.06 95% CI [1.02; 1.10], p = 0.004), modifed Rodnan skin score (OR 1.09; 95% CI [1.02; 1.19], p = 0.018), glucocorticoids (GCs) use > 3 months (OR 2.93; 95% CI [1.09; 7.88], p = 0.031), duration of GCs use (OR 1.06; 95% CI [1.01; 1.11] p = 0.009), cumulative dose of GCs (OR 1.02; 95% CI [1.01; 1.03], p = 0.004), glomerular filtration rate (OR 0.98; 95% CI [0.97; 0.99], p <0.001), body mass index (BMI) < 23 kg/m^2(OR 4.76; 95% CI [1.41; 16.67], p = 0.012), bone mineral density of lumbar spine (OR 0,13; 95% CI (0,02; 0,92), p = 0,040). Multivariate analysis confirmed the association between fragility fractures and age (OR 1.08; 95% CI [1.03; 1.14], p <0.001), modifed Rodnan skin score (OR 1.12; 95% CI [1.01; 1.24], p = 0.025) and GCs use > 3 months (OR 5.05; 95% CI [1.31; 19.37], p = 0.017).

Conclusion(s): We found out that 21% of SSc patients had a history of fragility fractures. The risk of fragility fractures was increased with age, modifed Rodnan skin score and GCs use > 3 months.

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THE VERTAIDO PROJECT (VERTEBRAL FRACTURE AI DETECTION FOR BETTER OSTEOPOROSIS CARE): IMPLEMENTATION OF AI-SCREENING IN CLINICAL ROUTINE – FIRST MONTH DATA

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Objective: Vertebral fractures are significantly underdiagnosed in routine clinical practice. Opportunistic screening using CT scans could enhance detection rates. This study aims to implement an MDR approved AI-screening tool (FLAMINGO, IB Lab) within a clinical Fracture Liaison Service (FLS), thereby integrating radiology with clinical care.

Materials and Methods: In this prospective study, the AI-screening tool was incorporated into clinical care, linking radiology workflows to a FLS. All patients over 50 years of age undergoing thoracic and/or abdominal CT scans for non-skeletal reasons (e.g. pneumonia, malignancy, kidney stones) at a medium-sized hospital, serving approximately 250,000 inhabitants, were included.

Results: During the first month, a total of 1,249 CT scans (1,127 unique patients) were screened using the AI algorithm, with 19% flagged as positive (238 CT scans [216 unique patients]). Radiologist confirmation indicated that 71% of these were true positives (169 CT scans [148 unique patients]). In the FLS triage, 74 of these 148 patients (50%) were referred for further osteoporosis investigation and treatment. The remaining patients were already known and under correct treatment (30%) or were terminally ill or had deceased shortly (during 3 months) after the CT (20%). In total, 6.5% of all patients originally screened were finally referred for a vertebral fracture that was new or had not been handled correctly before.

Conclusion: The implementation of the AI-screening tool (FLAMINGO, IB Lab) within the clinical FLS demonstrated significant potential to increase the detection of vertebral fractures and to enhance subsequent investigation and treatment of osteoporosis.

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THE PAEDIATRIC ACL NATIONAL AUDIT (PANA) STUDY

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Objectives

Paediatric anterior cruciate ligament (ACL) injuries are becoming increasingly common and pose significant management challenges. Without proper treatment, these injuries can lead to joint instability, increasing the risk of early-onset osteoarthritis and long-term functional impairments. The Paediatric ACL National Audit (PANA) Study aims to assess UK practices regarding adherence to BOAST guidelines for managing paediatric ACL injuries. Additionally, it seeks to identify opportunities to improve care for skeletally immature patients and standardise treatment to improve long-term musculoskeletal outcomes.

Methods

The Paediatric National ACL Audit (PANA) was a collaborative audit of 22 hospitals in England, Wales, and Scotland. It measured adherence to BOAST best practice guidelines for treating and diagnosing paediatric ACL injuries. Data were collected by orthopaedic surgeons and trainees using a secure online questionnaire regarding the service provision of centres managing ACL injuries in skeletally immature patients, including diagnostic imaging protocols, rehabilitation, post-operative follow-ups, and surgical techniques.

Results

Our analysis revealed significant differences in adherence to BOAST guidelines for managing ACL injuries among paediatric patients, with 65% of centres surveyed reporting the use of acute knee pathways and 68% utilising locally collaborative imaging pathways. Furthermore, our analysis revealed variability in post-operative monitoring, with approximately 59% of centres surveyed performing radiological growth monitoring and only

30% reporting functional outcomes post-operation. Additionally, re-rupture rates were found to be reported by fewer than 50% of surveyed centres, and adherence to rehabilitation protocols was implemented in 74% of surveyed centres.

Conclusion

The rising occurrence of ACL injuries in children underscores the need for standardised care delivery and reporting. Following the release of the BOAST guidelines in 2022, this nationwide audit has found discrepancies in practices throughout the UK. A multidisciplinary team (MDT) to standardise practice and promote best practices is essential for improving patient care and long-term musculoskeletal outcomes in this population.

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A STUDY OF MINERAL LEVELS IN ADULT PATIENTS WITH OSTEOGENESIS IMPERFECTA.

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Background: Osteogenesis imperfecta (OI) is a rare monogenic connective tissue disorder characterized by fragility of bones and recurrent fractures. In addition to the hereditary component, there are a number of factors that influence the course of the disease, the contribution of which is poorly understood, in particular the levels of some minerals.

Methods: A cross-sectional study was conducted involving 45 with OI and 45 healthy individuals. The concentrations of minerals (calcium, copper, inorganic phosphorus, zinc, and magnesium) and bone mineral density (BMD) were evaluated in all the participants.

Results: The concentrations of minerals in all the groups were within the reference values. In the OI overall, magnesium and copper were elevated, and phosphorus and zinc were lower. Type I exhibited higher concentrations of magnesium and copper and the lowest phosphorus; type III was associated with lower zinc, type IV with lower calcium and higher copper, and type V with the lowest phosphorus. OI overall was associated with lower BMD values. A correlational analysis in the OI group showed that the number of fractures correlated with BMD in absolute values but not with the Z-score.

Conclusions: The obtained data emphasize the importance of the levels of minerals in the pathogenesis of connective tissue diseases, in particular OI. As in the results of previous studies, the levels of minerals were within the population norm, which probably requires the development of individual criteria for the content of substances in this category of patients.

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DYSREGULATION OF ANGIOPOIETIN-LIKE PROTEINS TYPES 3 AND 6 IS ASSOCIATED WITH OBESITY IN PATIENTS WITH PSORIATIC ARTHRITIS

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Psoriatic arthritis (PsA), a type of arthropathy, combines immunometabolic disorders and lipid abnormalities and inflammatory manifestations due to the action of proinflammatory cytokines and adipokines.

Purpose of the study:

To evaluate the relationship of angiopoietin-like proteins types 3, 4 and 6 (Angptl 3,4,6) with obesity in patients with PsA.

Materials and Methods.

45 PsA patients (men 44.4%, women 55.6%) were under observation. The group of patients with abdominal obesity without arthropathies included 30 healthy individuals aged 22 to 53 years (18 women and 12 men).

All patients underwent clinical and laboratory examination, which also included determination of serum levels of Angptl types 3, 4, and 6 by enzyme immunoassay.

Results and Discussion.

Abdominal obesity is one of the most common chronic diseases that involves the accumulation of excess fat in the torso and internal organs. Obesity of various degrees was found in 37.8% of PsA patients. Angptl3 and Angptl6 content in obese patients (group 1) was significantly higher than in overweight patients (group 2) and in PsA patients without obesity (group 3) (Kruskal-Wallis test; p=0.002 and p=0.024, respectively), Angptl4 levels had no intergroup differences (p>0.05) (Table).

Table. Angptl content of types 3,4 and 6 in PsA patients depending on obesity

Показатели	Group 1 Obese patients (n=17)	Group 2 Overweight patients (n=14)	Group 3 Patients with normal body weight (n=14)
Angptl3, pg/mL	1276 ± 292 #	1074 ± 313	840 ± 306
Angptl4, pg/mL	414 ± 215	396 ± 156	341 ± 128
Angptl6, pg/mL	5,6 ± 1,7 #	7,2 ± 5,3	4,1 ± 1,7

Note: # – p<0.05.

The performed regression analysis labeled body mass index (BMI) as an independent predictor of Angptl6 concentration increase (F=8.6, β=0.408, p=0.005). We can assume the inclusion of different mechanisms involved in the dysregulation of Angptl types 3 and 6 in patients with obesity and arthropathies.

Conclusions.
Serum Angptl concentrations are variable in patients with arthropathies according to their different metabolic phenotypes. It is obesity that becomes the main destabilizing factor, which is accompanied by increased levels of Angptl types 3 and 6, in PsA patients in the presence of various metabolic disorders.

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PRESENCE OF CAGA-ASSOCIATED HELICOBACTER PYLORI INFECTION AFFECTS THE EFFICIENCY OF ERADICATION THERAPY IN RHEUMATOID ARTHRITIS

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Rheumatoid arthritis (RA) patients with CagA-associated Helicobacter pylori (H. pylori) infection tend to have more severe clinical manifestations of the disease. The virulence factor of H. pylori, cytotoxin-associated gene A (CagA), is able to influence the efficiency of eradication therapy.
Purpose of the study:
To evaluate the efficiency of eradication therapy in RA patients with CagA-associated H. pylori infection.
Materials and Methods.
40 women with RA and confirmed chronic H. pylori infection (DAS28-ESR 3.96±0.56 points) were examined. The efficiency of H. pylori eradication therapy was confirmed in 62.5% of RA patients. Patients were divided into two groups: group 1 - 22 RA patients with CagA-associated H. pylori infection (CagA+), group 2 - 18 RA patients with negative total antibodies to CagA H. pylori (CagA-).
Results.
The dynamics of laboratory parameters reflecting inflammatory and immunologic changes in patients with RA (before the start of eradication therapy and 4-6 weeks after its completion) showed a decrease in the levels of RF, CRP, IL-6, TNF-alpha, anti-CCP, angiopoietin-like protein type 3 (for all parameters $p<0.05$) in group 2 (CagA-), and in patients from group 1 (CagA+) there was a decrease only in CRP and IL-6 ($p<0.02$), which, still, is an important confirmation of the decrease in the activity of inflammation after eradication of H. pylori.
The success rate of H. pylori eradication in the short term in CagA+ RA patients (group 1) was lower than in patients from group 2 (CagA-) ($p=0.033$). It was also noted that the combination of high titers of anti-citrullinated antibodies (> 60 IU/mL) and CagA-associated H. pylori infection in RA patients was accompanied by more rare positive eradication results ($p=0.009$) within the established time frame.
Conclusions.
The efficiency of eradication depends on the presence of chronic variant CagA-associated H. pylori infection and the level of antibodies to citrullinated proteins. This should be taken into account when choosing a therapeutic intervention against H. pylori in this group of RA patients.

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ASSESSMENT OF FACTORS INFLUENCING CHRONIC POSTOPERATIVE PAIN AFTER LARGE JOINT REPLACEMENT IN RHEUMATOID ARTHRITIS

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Objective: To evaluate the effect of a number of clinical and psychological factors on the persistence of chronic postoperative pain for one year after hip and knee replacement in patients with rheumatoid arthritis.
Material and Methods: The study consistently included patients with rheumatoid arthritis who were admitted to the rheumoorthopaedic department from May 2022 to May 2024 for routine total knee/hip replacement. All patients were examined by a rheumatologist before surgery with an assessment of the disease activity according to DAS28-CRP, and were also asked to fill out the following questionnaires: Health Assessment Questionnaire (HAQ), painDETECT, Hospital Anxiety and Depression Scale (HADS), Pain Catastrophizing Scale.
Results: A total of 134 patients were recruited, 111 women (82.8%) and 23 men (17.2%). The average age was 56.7±13.7 years, the average duration of the disease was 14.9±10.8 years (Me [25‰;75‰] was 13.0 [7.0;20.0] years). The majority of patients had the stage II or III according to the Steinbroker's classification (33 and 34 patients, respectively). 20.1% showed signs of osteonecrosis. On average, signs of moderate disease activity were observed before surgery (DAS28-CRP was 3.5±0.8). 71.6% and 23.1% of patients received and conventional and biological disease-modifying antirheumatic drugs, respectively. After 12 months, 16.7% of patients continued to complain of pain in the area of the operated joint in the absence of infection or instability of the prosthesis components. The likelihood of pain retention correlated with the following factors ($p < 0.05$): female gender, depression according to HADS, high disease activity (DAS28-CRP is more than 5.2), neuropathic component of pain according to painDETECT, a tendency to catastrophize pain (more than 21 points on the scale of catastrophic pain). The duration of the disease or the severity of joint destruction were not significantly associated with the likelihood of chronic pain one year after the surgery.
Conclusion: Factors such as female gender, the presence of neuropathic pain, depression, and a tendency to catastrophize pain can contribute to the persistence of chronic pain in patients with rheumatoid arthritis after total knee and hip arthroplasty.

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TO THE QUESTION OF DENTAL HEALTH IN HIV-INFECTED PATIENTS

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Objective: The dentofacial system is an integral component of the human musculoskeletal system. According to the literature data, the processes occurring in the facial bones are similar to those in the supporting system bones. The most pronounced manifestations of this interrelation are observed in the periodontal tissues and the teeth themselves. Some researchers consider teeth to be derivatives of the skeletal system. In recent years, particular attention has been drawn to the patient dental health in the post-COVID period. **Study objective** – to conduct a qualitative and quantitative characterization of the carious process in HIV-patients who have recovered from *COVID-19*.
Methoods: A total of 95 HIV-patients aged 35-44 years were examined. Of which, 59 patients had a confirmed history of *COVID-19* (study group, SG), while the comparison group (CG) consisted of 36 HIV patients who had not had coronavirus infection. The caries prevalence and intensity were determined using the DMF-index (Decayed, Missing, Filled teeth).
Results: Caries prevalence reached 100% in both study groups. The DMF-index did not differ significantly between the two groups and amounted to 22,45±2,5 in the SG and 18,52±3,22 in the CG. However, qualitative analysis of the values for the DMF components showed significant differences (p<0,05) between the groups. The values for decayed, filled, and extracted teeth in the SG were 10,97±3,49, 5,71±4,08 and 5,77±2,42, respectively, compared to 6,03±2,75, 9,29±3,73 and 3,19±1,85 in the CG. Notably, patients in the SG reported "active loss of fillings" (complete or partial) both during and after *COVID-19* illness.
Conclusion: Among HIV-infected patients exposed to *COVID-19*, the number of filled teeth decreases, while the number of decayed teeth increases due to the loss of fillings. This issue requires further investigation, particularly from the perspective of correlating changes in both the immune system and the musculoskeletal system.

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HISTOMORPHOMETRIC INDICATORS OF THE PROXIMAL EPIPHYSEAL CARTILAGE OF TIBIAE IN JUVENILE RATS DURING 90-DAY CAFFEINE OVERCONSUMPTION AND CORRECTION WITH MEXIDOL

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Objective. Changes in the structure of proximal epiphyseal cartilage (PEC) of tibiae in male rats at juvenile age under excessive caffeine administration and correction with mexidol for 90 days.
Materials and Methods. The experiment involved 72 male rats with initial body weight 130-140 g. In the first group there were animals that received distilled water. In the second group animals received caffeine intragastrically in dosage 120 mg/kg/day. In the third group animals received caffeine in the same way as animals from the second group and additionally subcutaneously injected mexidol in dosage 50 mg/kg/day.
Results. In the second group there was a narrowing of the PEC, width of the osteogenesis zone in comparison with the first group on 90 days of the experiment by 6.42% and 7.83%. Also, on 90 days, the width of proliferating cartilage and destruction zones lagged behind the values of the first group by 7.02% and 6.28%, and the width of indifferent and definitive cartilage zones - by 6.17% and 5.19%.The specific number of osteoblasts and primary spongiosa decreased from the values of the first group on 90 days of the experiment by 7.19% and 5.33%. At the same time, the content of intercellular substance in PEC in juvenile rats exceeded the values of the first group by 5.84%. The width of the osteogenesis zone of the third group exceeded the values of the second group at 90 days of the experiment by 5.89%, and the specific number of primary spongiosa and osteoblasts - by 5.13% and 5.98%. Also, by 90 days of the experiment the values of the second group were higher: the width of the zone of indifferent, proliferating and definitive cartilage - by 4.96%, 4.82% and 3.78% and the width of the zone of destruction - by 4.64%.
Conclusion. In juvenile male rats, excessive administration of caffeine was accompanied by inhibition of bone-forming function of the PEC of tibiae. When mexidol was administered, the detected changes were restored.

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BONE MINERAL DENSITY IN PATIENTS WITH MAFLD AND TYPE 2 DIABETES MELLITUS

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Objective: Purpose of this study is analyzis of bone mineral density (BMD) in patients with metabolic-associated liver disease (MAFLD) and type 2 diabetes mellitus.
Methods: The study involved 100 patients of the State Healthcare Institution of the Republic of Crimea "N.A. Semashko Republican Clinical Hospital" with type 2 diabetes mellitus, including 56 patients with MAFLD and 44 patients without MAFLD. Age 58±6 years. Diagnostic criteria for MAFLD: the presence of fatty liver degeneration according to abdominal ultrasound, the presence of excess weight. Excess weight was defined as BMI ≥25 and <30 kg/m2. Exclusion criteria: liver cirrhosis, active viral hepatitis, autoimmune liver disease, liver tumors. BMD was measured using dual-energy X-ray absorptiometry at the lumbar spine and hip.
Results: Among patients with MAFLD, 42 (75%) had decreased BMD, of which 18 patients had BMD consistent with osteoporosis and 24 patients had osteopenia. Among patients without MAFLD, 19 (43%) had decreased BMD, of which 16 patients had osteope-

nia and 3 patients had osteoporosis.
Conclusion: Patients with type 2 diabetes with MAFLD are more likely to have decreased BMD than patients with type 2 diabetes without MAFLD.

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BONE MICROARCHITECTURE DISORDER IN POSTMENOPAUSEAL WOMEN WITH TYPE 2 DIABETES MELLITUS WITH NORMAL BONE MINERAL DENSITY

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Objective: Purpose of the study is estimation of the trabecular bone index TBS (Trabecular Bone Score) in postmenopausal patients with type 2 diabetes mellitus (T2DM) with normal bone mineral density (BMD).
Methods: The study involved 87 patients – postmenopausal women with type 2 diabetes mellitus (T2DM) aged 60±9 years. The HBA1 level was 7.2±0.3%. BMD, TBS were assessed by dual-energy X-ray absorptiometry (DXA). Exclusion criteria: risk factors for secondary osteoporosis, decreased BMD according to the T-score.
Results: 59 women (67.8%) had decreased TBS values (≤ 1.31). Among women with decreased TBS values, 41 women were obese (BMI ≥30 kg/m2), 16 women were overweight (BMI ≥25 and <30 kg/m2). Among the examined patients, there were 28 women (32.2%) with normal TBS values (≥1.35), of which 4 were obese and 12 were overweight.
Conclusion: Postmenopausal women with type 2 diabetes mellitus and normal BMD against the background of obesity were more likely to have impaired bone microarchitecture.

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BONE MICROARCHITECTONICS IN FEMALE PATIENTS WITH TYPE 2 DIABETES MELLITUS TAKING GLUCOCORTICOIDS IN POSTMENOPAUSE

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Objective: Purpose of the study is evaluation of the trabecular bone score (TBS) in postmenopausal patients with type 2 diabetes mellitus (T2DM) with normal bone mineral density (BMD) taking glucocorticoids for more than 3 months.
Methods: The study involved 60 patients – postmenopausal women with type 2 diabetes mellitus (T2DM) aged 55±6 years who took glucocorticoids for more than 3 months. The HBA1 level was 7.0±0.3%. In all patients, BMD and TBS were assessed using dual-energy X-ray absorptiometry (DXA). Exclusion criteria: other risk factors for secondary osteoporosis, decreased BMD according to the T-score.
Results: Of the 60 patients participating in the study, 43 patients (71.6%) had a decrease in TBS (≤ 1.31) against the background of normal BMD values.
Conclusion: TBS is a parameter that can complement DXA data to predict the risk of fractures in patients receiving glucocorticoids, regardless of BMD values.

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EVALUATION OF ADHERENCE TO TREATMENT WITH MODIFIED ANTI-INFLAMMATORY DRUGS IN PATIENTS WITH RHEUMATOID ARTHRITIS AND ISCHEMIC HEART DISEASE

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Objective: To present the results of the analysis and assessment of the state of adherence of patients with rheumatoid arthritis (RA) depending on the presence of coronary heart disease (CHD) to treatment with Disease-modifying anti-rheumatic drugs (DMARDs) and to identify possible determinants of patient non-adherence.
Methods: An analysis and assessment of adherence to DMARD therapy was performed in 76 patients with confirmed RA without (n=42) and in combination with CHD (n=34), who had previously (before the start of this study) been prescribed a long-term course of treatment with DMARDs.
Results: In the examined patients with advanced RA, the number of patients adherent to basic therapy was 19.9%, the remaining patients (80.1%) were classified as partially adherent to treatment. It was revealed that the leading factors of non-adherence in patients suffering from RA to the treatment received were mostly due to the presence of side effects of drugs, as well as the existing concomitant disease of coronary heart disease drugs and the presence of coronary heart disease.
Conclusion: The results of the study indicate a very low adherence of patients suffering from RA, especially patients simultaneously suffering from coronary heart disease, to DMARD therapy, which shows the need to find modern approaches to improve the adherence of patients of this combination of patients to treatment, it is extremely necessary to conduct national educational programs.

P272

THE DYNAMICS OF THE INCIDENCE OF GERIATRIC PATIENTS IN WESTERN SIBERIA

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Introduction. The main goal of public health according to the WHO concept of healthy aging was active functioning throughout life. Medical professionals in practical conditions could identify a decrease in physical and mental abilities (clinically expressed as health disorders) and took effective measures to prevent or slow down the development of these disorders.
The purpose of the study. To analyze the dynamics of the incidence of geriatric patients in the south of the Tyumen region based on the study of the "report on the health status of the population and the organization of healthcare in the Tyumen region based on the results of activities for 2022."
Materials and methods. We conducted an analysis of the "report on the health status of the population and healthcare organizations in the Tyumen region based on the results of activities for 2022."
Results. The general morbidity rate among people over working age increased by 14.8% (from 227,546.5 per 100,000 population of the corresponding age in 2020 to 261,112.1 in 2022). At the same time, the largest increase was observed in the class of respiratory diseases (15.2%), diseases of the endocrine system (14.7%), diseases of the circulatory system (12.9%), mental disorders (7.4%), certain infectious and parasitic diseases (6.2%). In the structure of registered diseases, the first place was occupied by diseases of the circulatory system (29.7%). This is followed by respiratory diseases (12.1%), diseases of the endocrine system (9.5%), diseases of the musculoskeletal system (8.6%), diseases of the eye and its appendage (7.2%), diseases of the digestive system (5.8%), neoplasms (5.4%) and diseases of the genitourinary system (5.1%). In 2022, there was an increase in the primary morbidity rate of people over working age by 45.8%. The greatest increase was observed in the following classes: diseases of the circulatory system (44.7%), diseases of the nervous system (24.7%), respiratory diseases (18.6%), diseases of the musculoskeletal system (10.1%), diseases of the genitourinary system (8.8%), diseases of the ear and mastoid process (8.0%), etc. A decrease in primary morbidity was noted in the class of diseases of the digestive system by 21.3%. In the structure of newly identified diseases, the first place was occupied by respiratory diseases (31.4%), followed by diseases of the circulatory system (10.8%), diseases of the eye and its appendage (3.7%), neoplasms (2.7%), diseases of the digestive system (2.5%), diseases of the ear and mastoid process (2.4%), diseases of the skin and subcutaneous tissue (2.3%).
Conclusions. By the age of 60, the main causes of disability and death were age-related hearing, vision, and mobility loss, as well as diseases such as dementia, heart disease, stroke, chronic respiratory diseases, diabetes mellitus, and diseases of the musculoskeletal system, in particular osteoarthritis and back pain.

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RARE LYSOSOMAL DISEASES IN NEUROLOGICAL PRACTICE

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In the neurological department of the Minsk Regional Children's Clinical Hospital, we recently observed 2 cases of lysosomal diseases - glycolipidosis with a predominant lesion of the nervous system: GM2 gangliosis - Tay-Sachs disease, and cerebrosidosis - Krabbe's disease.
At the heart of Tay-Sachs disease is a genetically determined disorder of the metabolism of gangliosides, accompanied by their increase in the gray matter of the brain, liver, spleen. The type of inheritance is autosomal recessive, the deficiency of the enzyme hexosaminidase A is determined. The frequency of infantile gangliosidosis is 1: 250,000. Vision decreases and is rapidly lost, a special feature is the "cherry spot", which is translucent vessels at the site of destruction of several layers of the retina. Here is a brief description of the case. Girl KD, 1 year 5 months, complaints of developmental delay - does not hold her head, does not turn over, does not sit, does not walk, does not talk. From 1 year 4 months, seizures appeared in the form of short-term tremors of the limbs. Twice, up to 1 year 5 months, she was treated in the neurological department due to delayed psychomotor development, was examined by geneticists in order to clarify the diagnosis. Objectively: the head is macrocephalic in shape, does not hold the head, the large fontanelle is closed, does not turn over, does not sit, does not walk. Exotropia. Muscle tone is sharply reduced in the limbs, there is no support. Tendon-periosteal reflexes are reduced. R-CT of the brain: The cortex and white matter of the brain are well developed. No foci of pathological density were found in the brain matter. The ventricular system is moderately dilated. The lateral ventricles are symmetrical. The subarachnoid space of the cerebral hemispheres and cerebellum is uniformly expanded to 7 mm. Conclusion: CT - signs of mixed hydrocephalus. O. ophthalmologist: does not fix the toy, the direct reaction of the pupils is sluggish. The fundus of the eye: the optic nerve disks are pale, the contour is clear, the vessels are 1: 2 (3), the course is normal. In the macular zone, there is a bright red rounded dystrophic focus, rounded with a whitish corolla. Visible periphery without pathology. Diagnosis: Tay-Sachs disease. Partial atrophy of the optic nerves in both eyes. Results of genetic testing:
1. At the Institute of Genetics and Cytology of the National Academy of Sciences of Belarus (laboratory of nonchromosomal pathology), mitochondrial DNA

was analyzed for the presence of T8993 G mutations (maternal inherited Lee syndrome) and A3343 G (MELAS syndrome), as well as for the presence of large deletions of MT DNA. PCR analysis of DNA samples isolated from leukocytes was carried out. According to the results of DNA analysis, these violations of the mitochondrial genome were not revealed.
2. Activity of lysosomal enzymes in leukocytes: decreased activity of β-hexosaminidase A: 10.7; 7.2 mmol / g per mg of protein (norm 180-470).
Diagnosis: GM2 - gangliosidosis. Tay-Sachs disease. The risk of having a child with such diseases in the family is 25% - high. Material from a sick girl and her parents was sent for DNA research to the Medical Genetic Research Center of the Russian Academy of Medical Sciences, Moscow - a partial analysis of the HEXA gene (Tay-Sachs disease, H1H 272800). Treatment is symptomatic, specific enzyme replacement therapy has not been developed. The girl received anticonvulsants: depakin, carbamazepine, topamax, as well as diacarb, asparkam, emoxipin. 5 years ago, another girl with a diagnosis of globoid cell leukodystrophy - Krabbe's disease underwent inpatient treatment twice in the neurological department of the ultrasound department of the Moscow Regional Children's Clinical Hospital.
The child was admitted at the age of three months with complaints of delayed psychomotor development, constant unmotivated cry, malnutrition, then myoclonic convulsions appeared. The objective status was spastic tetraparesis, increased tendon-periosteal reflexes, pseudobulbar disorders, muscle hypertension, which was later replaced by hypotension. The disease progressed, due to a violation of swallowing, the child suffered aspiration pneumonia.
According to a decrease in the activity of the enzyme galactosylceramide-β-galactosidase in the medical genetic center of Minsk, the diagnosis was made - Krabbe's disease. At the age of 1, the girl died.
The type of inheritance of Krabbe's disease is autosomal recessive. To date, there are enzyme replacement drugs for the treatment of a number of extremely rare diseases: mucopolysaccharidosis - types 1,2,6, Gaucher disease, Fabry disease, Pompe syndrome, but in case of brain damage, there is no enzyme therapy, since the drugs do not penetrate the blood-brain barrier. Intensive clinical research is underway around the world to develop effective enzyme replacement therapy.

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X-LINKED OSTEOGENESIS IMPERFECTA DUE TO A NOVEL PLS3 PATHOGENIC VARIANT IN TWO BROTHERS

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Objective
Plastin-3 (PLS3) functions as an actin-binding protein which is involved in cytoskeleton remodeling. In bone, plastin-3 is part of the mechanosensitive mechanism of osteocytes and is involved in the mineralization process. We present clinical cases of two brothers with novel *PLS3* variants.
Methods
Whole-exome sequencing was performed on G400 (BGI, China) to identify the cause of bone fragility.
Results
Two brothers were referred due to bone fragility.
Patient 1, 20 y.o. suffered from multiple fractures starting from age 6 when bilateral forearm fractures occured. At age 15 multiple vertebral fractures (VFs) and a patellar fracture were diagnosed. DXA showed low BMD: L1-L4 -4.8SD, femoral neck -3.9SD, hip -4.2SD Z-score. Secondary causes of osteoporosis were excluded. This patient received levothyroxine 100mkg due to congenital hypothyroidism. At age 19 multiple Th2-8, 11-12, L1-5 VFs were diagnosed, along with elevated osteocalcin 94.89 ng/mL (24-70), CTx 1.56 ng/mL (0.1-0.85), alkaline phosphatase 204 IU/L (40-150). Treatment with zoledronic acid 5 mg was initiated. A year later DXA showed BMD improvement: L1-L4 -4.2SD, femoral neck -2.6SD, total hip -2.6SD Z-score, no new VFs or non-vertebral fractures were detected. One more infusion of zoledronic acid 5 mg was given.
Patient 2, 38 y.o. suffered multiple fractures (forearm bones, proximal humerus, ribs, metacarpal and metatarsal bones, multiple VFs, greater trochanteric fracture) from age 10. Secondary causes of osteoporosis were excluded. At age 35, this patient received zoledronic acid 5 mg. At age 37, DXA results were: L1-L4 -2.4SD, neck -2.3SD, hip -2.6SD Z-score. CT showed new VFs Th4-12, L1-L5. Teriparatide 20 µg daily was prescribed. A year later DXA did not show improvement, however no new fractures were recorded.
Both brothers had normal height, no visual bone deformities or blue sclera. Exome sequencing revealed a novel most likely pathogenic variant in *PLS3* (NM_005032/7) c.836_837dup (p.His280Phefs*43) which has not been previously described in the literature.
Conclusion: A novel *PLS3* variant in two brothers with multiple VFs and non-vertebral fractures adds to the description of this rare osteogenesis imperfecta with multiple fractures starting in a late childhood which may be successfully treated by zoledronic acid or teriparatide.

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SERUM OSTEOCALCIN AS A PREDICTOR OF TREATMENT EFFICACY IN PRIMARY OSTEOPOROSIS

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Objective: Osteocalcin levels vary widely among healthy individuals. The diagnosis of osteoporosis should be based on bone density or a clinical history that includes low-trauma fracture. Osteocalcin levels should not be used to diagnose osteoporosis. Serum osteocalcin has become known as a bone formation biomarker for the evaluation of treatment response in postmenopausal osteoporosis. The present study aim to evaluate if we can rely on baseline osteocalcin level as a predictor of treatment efficacy in

postmenopausal women.
Material and Method: Forty-one women with postmenopausal osteoporosis diagnosed by DEXA(Tscore≤-2.5) were included in this study. Mean age of the patients was 61±9.02 years. Serum osteocalcin, calcium and alkaline phosphatase (ALP) were measured at baseline and after 180 days. All the patients were put into treatment with ibandronic acid 150 mg/monthly. Mean serum osteocalcin at baseline was 16.33±4.1 ng/ml, which decreased significantly after 180 days of treatment with ibandronate, reaching 10.51±3.9 ng/ml.The reference range in adult female is 3.1-14.4 ng/ml.Mean value of DEXA at baseline was Tscore-3.5± 0.9 and after 6 month of treatment Tscore -3.2±1.1 .

Results: The group of patients with the lowest level of osteocalcin at baseline didn't show any difference at the outcomes after 180 days of treatment with ibandronate in comparison with the group of the patients with highest level of serum osteocalcin .

Conclusion: As the measurement of serum osteocalcin is considered a tool for monitoring the results of treatment in osteoporotic patient as the osteocalcin levels decreased after treatment of osteoporosis on the other hand it didn't show any correlation between serum osteocalcin levels before treatment and treatment outcomes

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BONE TISSUE STRUCTURE DISORDERS IN SPINAL MUSCULAR ATROPHY: THE ROLE OF ORTHOPEDIC DIAGNOSTICS

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Objective: To evaluate orthopedic pathology and structural changes of bone in patients with spinal muscular atrophy (SMA).
Materials and methods. Five patients with SMA were examined: 3 patients - type I, 2 patients - type II. Patients' age: 1 adult - 35 years, 4 children - 8±2 years: female - 4, male - 1; did not move independently, are in a wheelchair. Orthopedic pathology: osteoporosis, pathological fractures were revealed in 2 patients: femur - 1, tibia - 1. Patients were examined clinically, radiologically, X-ray densitometrically; two patients received spinraza, risdiplam and zolgensma. In order to improve the structural condition of bone tissue and prevent pathological fractures of long bones, three patients were administered bisphosphonates (zoledronic acid - 0.025 mg / kg of weight) once every six months (2 injections).
Results and discussion. All patients had muscle strength of 2-3 points on the MRC scale. Orthopedic pathology was diagnosed: S-shaped scoliosis – 5, bilateral hip dislocation – 3; coxa valga bilateralis – 1, flexion contractures in the hip and knee joints – 5, foot deformities – 4. In all patients, a violation of the structural state of bone tissue was established: in an adult patient, T-criterion – lumbar spine - 4.7 SD, proximal femur - 3.6 SD, in pediatric patients, Z-criterion fluctuations in the lumbar spine range from – 1.1 SD to 1.4 SD, in the proximal part of the femur from - 3.6 SD to 3.8 SD. The absence of a decrease in bone mineral density in the lumbar spine in children, and its decrease in the proximal femur in all patients and the lumbar spine only in an adult, can be explained by the loading of the spine when sitting in children and age-related changes and the duration of the disease in adults.
Conclusion. In patients with SMA, there is a disruption of the neuromuscular connection, which, leads to the development of osteoporosis and pathological fractures. In order to prevent this, we believe it is necessary to undergo X-ray densitometric examination to determine the disruption of the bone tissue condition with its subsequent correction.

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MUSCLE BODY COMPOSITION ANALYSIS IN PATIENTS WITH METABOLIC SYNDROME UNDERGOING MEDICAL REHABILITATION TREATMENT WITH INTERMITTENT HYPOXIA-HYPEROXIA THERAPY

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Objective: Body composition analysis is essential for a detailed evaluation of body structure, providing valuable information about the proportions of muscle mass, fat, water, metabolic age and bone mass. This data allows a more precise assessment of health status, monitors progress following therapeutic interventions and helps personalize strategies for health promotion. Intermittent hypoxia-hyperoxia therapy (IHHT) involves alternating periods of exposure to hypoxia and hyperoxia, with significant results on various pathologies according to studies in the specialized literature [1,2]. This study aimed to analyze whether IHHT affects the assessment of muscle body composition in individuals with metabolic syndrome (MS).
Material and Methods: A study was carried out involving 40 individuals diagnosed with MS admitted to the Balneal and Rehabilitation Sanatorium of Techirghiol. Patients were randomized into two groups: a control group (20 patients) who received placebo therapy and an intervention group (20 patients) who received IHHT. At the same time, all patients also received complex medical rehabilitation treatment. The muscle body composition of

these patients was analyzed using a body composition analyzer scale.
Results: The study revealed no notable differences in muscle mass and muscle score between the two groups. Both groups, however, showed improvements in muscle quality (p=0.001 for the control group, p=0.040 for the intervention group), highlighting the importance of medical rehabilitation even without a significant effect of IHHT.
Conclusions: These findings emphasize the importance of medical rehabilitation as an essential approach to improving muscle quality in patients, regardless of the absence of IHHT as an additional intervention.

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DYNAMIC EVALUATION OF MUSCLE FUNCTION IN PATIENTS WITH SARCOPENIA USING ADVANCED METHODS WITHIN THE REHABILITATION UNITS

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Objective: Sarcopenia is an underdiagnosed pathology in medical practice worldwide. The dynamic assessment of muscle function through advanced methods in patients with sarcopenia involved in a complex medical rehabilitation program provides valuable insights for further research on this medical condition.
Material and Methods: This study, conducted over six months, between January and June 2024, included 100 patients hospitalized at the Balneal and Rehabilitation Sanatorium of Techirghiol, Romania. The patients included in the study were evaluated using specific tests. In confirmed cases, handgrip strength was assessed using a dynamometer, muscle mass and muscle quality were measured with a specialized electronic scale and muscle tone was evaluated through surface electromyography (sEMG). Assessments were performed at admission and discharge, following a complex medical rehabilitation program, designed to optimize the recovery of patients with sarcopenia.
Results: Sarcopenia was confirmed in 66% of the patients, of whom 82% were women and 18% were men, with a distribution of 36% in the 60-69 age group and 64% in the 70-79 age group. In confirmed cases, the rehabilitation treatment led to significant improvements in handgrip strength (88%), muscle mass (79%), muscle quality (86%) and muscle tone (86%). Statistically significant differences were observed over time, between admission and discharge, for muscle tone assessed through sEMG ($p<0.01$), handgrip strength ($p<0.01$), muscle quality ($p<0.01$) and muscle mass ($p<0.05$). Relevant correlations were identified between the assessment of muscle quality and handgrip strength at discharge, between muscle mass values and handgrip strength at both admission and discharge and between muscle tone values at admission and discharge.
Conclusions: Identifying sarcopenia, implementing a complex medical rehabilitation program and monitoring the dynamic improvement of body composition using anthropometric measurements and muscle tone through sEMG in the examined patients highlights the importance of increasing patients' access to rehabilitation units as they age, the need to routinely perform investigations for sarcopenia and opens new horizons for the development of a standardized protocol for patients with sarcopenia.

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HEMATOLOGICAL CHANGES IN SYSTEMIC SCLEROSIS (SS) PATIENTS AND CORRELATIONS WITH DISEASE SEVERITY: A SYSTEMATIC REVIEW

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Objectives: This review analyses how simple biomarkers – platelet to lymphocyte ratio (PLR), mean platelet volume (MPV) and red blood cell distribution weight (RDW), modify in SS and complications as interstitial lung disease (ILD).
Method: PubMed, Web of Science and ScienceDirect, Elsevier databases were researched by: ((rdw) OR (red blood cell distribution weight) OR (mean platelet value) OR (mpv) OR (platelet to lymphocyte ratio) OR (plr)) AND ((ssc) OR (systemic sclerosis)). PRISMA methodology was applied. 7 studies from the past ten years have been included. PLR, MPV and RDW were compared in SS patients and healthy controls and between patients with and without ILD.
Results: The meta-analysis showed a higher PLR in SS patients compared to controls - SMD=0.24, CI95%: [0.09, 0.39]. MPV and RDW in SS groups versus controls were not statistically significant (SMD MPV= 0.05, CI95% MPV: [-0.08, 0.19], SMD RDW= 0.01, CI95%: [-0.13, 0.16]). Regarding the changes in ILD patients compared to non-ILD patients, PLR was higher in the ILD group SMD=0.46 and 95%CI: [0.21, 0.72], as well as RDW, with a SMD= 0.36 and a 95%CI: [0.09, 0.62]. Nonetheless, MPV was not statistically significant different in the two cohorts.
Discussion: The results show that PLR is expected to be higher in SS patients, however the difference was modest. PLR and RDW were greater in those with lung involvement. MPV differences between the patients and controls and between ILD and non-ILD subjects were not significant. Nevertheless, the number of stud-

ies found to evaluate the connections presented was limited and not all of them assessed all 3 indicators.
Conclusions: Simple bloodwork parameters might modify in SS. PLR and RDW could increase in lung disease associated in SS patients, and introduced in severity predicting scores, as the changes observed individually were small. Regarding this subject, more research has to be done.

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DIABETES DECOMPENSATION, OBESITY, HIGH ABDOMINAL FAT, LOW MUSCLE AND BONE MASS, VITAMIN D DEFICIENCY, AGE - CHARACTERISTIC OF HIP OSTEOPOROSIS IN POSTMENOPAUSAL DIABETICS

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In the country, there is a lack of systematic research in postmenopausal women with type 2 diabetes (T2DM) regarding the state of their bone system. **Aim**: To investigate a group of postmenopausal women with T2DM regarding factors that are associated with the development of osteoporosis/osteopenia in them. **Material**: 47 postmenopausal women with T2DM (59.19±6.53 years old) divided into two age groups: young – 49–59 years (n-22) and adults – 59–69 years (n-25); on oral treatment were 93.6% and significant percent of them were with HbA1c >7% (p<0.001) - 63.8% (30/47). **Methods**: Standard biochemical and hormonal tests, measurement of standard BMD (DXA), abdominal fat tissue (%), muscle and bone mass (Bio Impedance) were performed. **Results**: 80.9% (38/47) were with BMI ≥30 kg/m2 (p<0.001). The relative share of abdominal fat (%) in the entire group of subjects was significantly higher - 83.7% (36/43) (p<0.001). Muscle mass over 45 kg was present in the group of young people (49-59 y) in 81.8% (18/22), and in adults (59-69 y) only in 52% (13/25), p<0.02. Bone mass <2.5 kg was present in 64% (16/25) of 59-69 year old diabetics, while bone mass >2.5 kg is present only in 36% (9/25) - p<0.001. In the younger age group (49-59 years) there was no significant difference (<2.5 kg in 45.5% vs. >2.5 kg in 54.5%, NS). A significant difference was found when comparing groups with sufficient level of vitamin D (>30 ng/ml) and those with deficiency and insufficiency (<30 ng/ml): 19.15% (9/47) vs. 80.85% (38/47) - p<0.001. Osteoporosis and osteopenia in the spine were present in 29.8% (14/47) of the examined, with no significant difference between the two age groups. Osteoporosis and osteopenia of the hip in the group of older people (59-69 y) diabetics were present in in 91.66% (22/24), and in 8.34% normal BMD (2/24), p<0.02. In the younger group (49-59 years), no significant difference was found - 68.4% (13/19) vs. 31.6% (6/19), NS. **Conclusion**: Diabetics with hip osteoporosis and osteopenia have significantly more often HbA1c >7%, BMI >30 kg/m2, higher percentage of abdominal fat, low muscle and bone mass, vitamin D <30 ng/ml.

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PREVALENCE AND RISK FACTORS FOR VERTEBRAL COMPRESSION FRACTURES IN ANKYLOSING SPONDYLITIS PATIENTS UNDER 50: A CROSS-SECTIONAL STUDY

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Introduction
Vertebral compression fractures (VCFs) are a significant complication of ankylosing spondylitis (AS), particularly in younger patients. Unlike primary osteoporosis, which predominantly affects postmenopausal women and elderly individuals, VCFs in AS occur in patients under 50 years old due to systemic inflammation and disease-related bone fragility. The primary objective of this study was to determine the prevalence of VCFs in AS patients under 50 and identify associated risk factors.
Patients and Methods
This prospective, monocentric, observational cross-sectional study was conducted from October 2020 to October 2022. We included AS patients aged 18–49 without associated inflammatory rheumatic diseases or other clinical conditions predisposing to bone fragility, such as endocrine or gastrointestinal disorders, except those on corticosteroid therapy. VCFs were assessed using lateral spine radiographs and graded according to the Genant classification. BMD was measured using DXA at the lumbar spine (L1-L4) AP, femoral neck, and total hip.
Results
A total of 102 AS patients (70 men, 32 women) were included, with a mean age of 35.6 years. Chronic smoking was noted in 32.4% of the patients, exclusively in men. The mean age at symptom onset was 25 years, with a mean disease duration of 11 years. The average BMI was 26.56 kg/m². Peripheral joint involvement was present in 31.37%, and coxitis was reported in 23.57%. Most patients exhibited elevated inflammatory markers, with a mean CRP of 17.3 mg/L, and 59.8% were HLA-B27 positive. The mean ASDAS-CRP was 2.63, and 48% had at least one syndesmophyte. VCFs were observed in 34.31% (n=35) of patients, with 14 patients classified as grade 2 or 3. Trabecular bone loss (lumbar spine L1-L4) was present in 17.65% (n=18), and cortical bone loss (femoral neck or total hip) in 5.88% (n=6). In total, 21.57% (n=22) had low BMD at one or more sites. Risk factors for VCFs included male sex (p=0.005), elevated inflammatory markers (CRP ≥ 6 mg/L, p=0.002), thrombocytosis (p=0.027), and high disease activity scores (ASDAS-ESR, p=0.019; ASDAS-CRP, p<0.001).

Conclusion
VCFs are a common complication in AS patients under 50, affecting over one-third of the studied population. This fracture risk is strongly associated with systemic inflammation, disease activity, and trabecular bone loss. These findings emphasize the importance of early screening and targeted management of bone health in young AS patients to prevent debilitating complications. Further randomized controlled trials are needed to confirm these observations and develop optimal prevention strategies.

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THE SARC-F SCORE AND ASSOCIATED FACTORS IN COMMUNİTY-DWELLİNG OLDER ADULTS

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Introduction: Sarcopenia, characterized by reduced muscle mass and strength, leads to functional decline, increased fall risk, and decreased quality of life in older adults. The SARC-F questionnaire is a widely used screening tool for sarcopenia. This study aims to evaluate the demographic, clinical, and biochemical factors influencing SARC-F scores in community-dwelling older adults.
Methods: We conducted the study retrospectively and cross-sectionally. We included 366 people aged ≥60 years who applied to the geriatric outpatient clinic.. Participants were categorized as SARC-F positive (≥4 points) or negative (<4 points). Data on demographic characteristics, chronic conditions, functional measures (ADL, IADL), cognitive performance (MMSE), nutritional status (MNA-SF), frailty (FRAIL), and biochemical parameters (e.g., CRP, ESR) were analyzed.
Results: SARC-F positivity was identified in 35.1% of participants. SARC-F positive individuals were older (77.1 ± 7.6 vs. 71.1 ± 7.0 years, p<0.001), predominantly male (83.1% vs. 34.4%, p=0.001), and had poorer functional (ADL, IADL, p<0.001), cognitive (MMSE, p=0.003), and nutritional (MNA-SF, p<0.001) status. Inflammatory markers (CRP, ESR) were significantly elevated (p=0.010, p=0.001). Regression analysis identified age, depressive symptoms (GDS-SF), functional independence (IADL), and cognitive performance (MMSE) as significant predictors of SARC-F positivity.

Conclusions: SARC-F scores are strongly associated with age, functional independence, cognitive impairment, and inflammation, reflecting the multifactorial nature of sarcopenia. Comprehensive assessment and multidisciplinary approaches targeting these factors are essential for early detection and management of sarcopenia in older adults.

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MANAGING ASYMPTOMATIC HYPERURICEMIA: INSIGHTS AND PRACTICES FROM A RHEUMATOLOGIST SURVEY

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Introduction
Asymptomatic hyperuricemia (AHU) is a common condition in rheumatology practice, yet its management remains a subject of debate. Musculoskeletal ultrasound has recently emerged as a valuable tool for detecting urate deposits in patients with hyperuricemia or gout. Our survey aimed to explore rheumatologists' perceptions and practices regarding AHU, as well as their approach to using musculoskeletal ultrasound in this context.
Materials and Methods
We conducted a knowledge, attitudes, and practices (KAP) survey among Algerian rheumatologists. The survey, distributed as an anonymous online questionnaire, consisted of 16 questions across four themes: professional experience and practice settings (4 questions), the definition of asymptomatic hyperuricemia (3 questions), the use of musculoskeletal ultrasound (5 questions), and strategies for managing hyperuricemia (3 questions). A total of 246 responses were collected via professional networks and email invitations, with 89 responses validated for analysis.
Results
Among the 89 validated respondents, 39 had over 15 years of rheumatology experience, 25 had 5–15 years of experience, and 25% had less than 5 years of experience. A quarter of participants reported no experience with musculoskeletal ultrasound, while half had 1–10 years of experience or more.
Regarding the definition of AHU, one-third of rheumatologists defined it as serum urate levels exceeding 6 mg/dL in men and 5 mg/dL in women, while approximately half adhered to thresholds of 7 mg/dL in men and 6 mg/dL in women. Over half of the respondents reported measuring serum urate levels in the presence of comorbidities, whereas a quarter did so only when clinical signs of gout were apparent.
In terms of treatment, over 80% of rheumatologists did not treat AHU systematically, with only 10% doing so as a standard practice. Concerning the use of musculoskeletal ultrasound, more than one-third of respondents considered it unnecessary for managing AHU, while half employed it to detect "hidden" gout through urate deposits. One-fifth of participants did not use ultrasound to diagnose gout, and over 30% did not consider ultrasound-detected urate deposits or gout signs in their practice. Furthermore, more than 10% were unaware of current guidelines for managing AHU.
Conclusion
This survey highlights significant variability in rheumatologists' approaches to asymptomatic hyperuricemia and the use of musculoskeletal ultrasound. The findings underscore the need for continuous education and the standardization of guidelines to

optimize the management of AHU patients.

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SAFETY OF 23-VALENT PNEUMOCOCCAL POLYSACCHARIDE VACCINE IN PATIENTS WITH RHEUMATOID ARTHRITIS, ANKYLOSING SPONDYLITIS AND PSORIATIC ARTHRITIS (PRELIMINARY DATA)

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Objective(s)
To study the safety of 23-valent pneumococcal polysaccharide vaccine (PPV-23) in patients with rheumatoid arthritis (RA), ankylosing spondylitis (AS) and psoriatic arthritis (PsA).
Material and Methods
The open prospective study included 96 patients with RA, 52 with AS and 27 patients with PsA; 98 female; men age was from 20 to 79 years; disease duration was from 5 months to 42 years. At the time of vaccination, the disease activity in patients with RA according to the DAS28 index was 4,14±1,3, disease activity in patients with AS and PsA according to the BASDAI index was 4,3±2,2. The majority of patients (84.1%) at the time of inclusion in the study received immunosuppressive therapy: 73 – methotrexate (MT), 1– MT+sulfasalazine, 14 – leflunomide, 41 – TNF-α inhibitors±disease-modifiying anti-rheumatic drugs (DMARDs), 2 – abatacept (ABC)±DMARDs, 6 – rituximab (RTX)±DMARDs, 11 – IL-17 inhibitors±DMARDs, 1 – tofacitinib. PPV-23 was injected in an amount of 1 dose (0.5 ml) into the deltoid muscle of the shoulder against the background of anti-rheumatic therapy.
Results
Post-vaccination reactions (PVRs) were noted in 41.2% of patients with RA, 24.1% of patients with AS and PsA. 80.9% of PVRs were local. Of the local PVRs, the most frequently recorded were pain, redness and swelling (≤2.5 cm) at the injection site, of the systemic ones - subfebrile temperature. Three patients with PsA and one patient with AS developed a pronounced local reaction in the form of pain in the arm, infiltrate and hyperemia of the skin from 8 to 15 cm in diameter, accompanied in two patients by subfebrile temperature for 2 days, in two others - febrile fever for 3 days. The indicated PVRs were completely stopped by symptomatic therapy. In general, no significant negative effect of vaccination on the disease activity. One month after vaccination with PPV-23, DAS 28 was 3,7±1,2, BASDAI was 3,7±2,1. Within a month after the introduction of PPV-23, an exacerbation of the disease was observed in two patients with AS, aged 28 and 25.
Conclusion(s)
The data obtained indicate sufficient safety of PPV-23 in patients with RA, AS and PsA. Further studies are needed to assess the effect of the PPV-23 on the on the course of rheumatic diseases.

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IMMUNOGENICITY OF 23-VALENT PNEUMOCOCCAL POLYSACCHARIDE VACCINE IN PATIENTS WITH RHEUMATOID ARTHRITIS, ANKYLOSING SPONDYLITIS AND PSORIATIC ARTHRITIS (PRELIMINARY DATA)

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Results
The dynamics of antibody concentration to pneumococcal capsule polysaccharide is presented in the table.

Table 1. Pneumococcal antibody levels in patients with RA, AS and PsA, U/ml, Me [25th, 75th percentiles].

Visit I	Visit II	Visit III	Visit IV
67.3 [31.5; 135.3]	197.95 [72.0; 266.4]	212.9 [61.95; 305.5]	134.2 [53.0; 250.62]

$p_{I\text{-}II, I\text{-}III, I\text{-}IV} \leq 0{,}001$

After 1, 3 and 12 months after vaccination, a significant increase in the concentration of antibodies to pneumococcal capsular polysaccharide was observed compared with the initial indications. A positive antibody response (≥ twofold increase pre- to postvaccination) was seen in 58.3% of RA patients, 16.7% of AS patients, 25% of PsA patients. Respondents had, on average, lower baseline levels of antibodies to pneumococcal capsular polysaccharide. Both groups (responders and non-responders) were

comparable in age and disease duration. Disease activity score and therapy, including TNF-α inhibitors and MT, did not significantly affect immunogenicity.
Conclusion(s)
The data obtained indicate sufficient immunogenicity of PPV-23 in patients with RA, AS and PsA. Further studies are needed to assess the effect of the therapy on the immunogenicity of PPV-23, as well as the clinical efficacy of this vaccine.

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POST-CANCER PATIENTS HAVE A HIGH PREVALENCE OF OSTEOPOROSIS

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Introduction. With the advancement of oncological strategies, more and more patients are in remission and entering a post-cancer state. Bone health becomes a crucial issue to recover physical activity and autonomy. Our aim is to describe the bone health of the post-cancer cohort in our institution.
Patients. Post-cancer patients at our institution undergo a one-day global health assessment (JUMP programme) within the 12 months of remission to identify sequelae and propose personalised care. Bone assessment includes risk factor questionnaire, biology and osteodensitometry (Horizon Wi/W, Hologic®).
Results. Between February 2022 and May 2024, 212 patients underwent the JUMP programme. The population was (mean ± SD) 53.2 ±13.3 years old, predominantly female (66%) and Caucasian (86%). BMI was 27.0 ±6.4 kg/m². The most common cancer etiologies were lymphoma (34%), breast (26%), testicular (11%), ovarian (6%), digestive (6%) and myeloma (5%).
Only 17 (8%) had a family history of hip fracture and 24 (11%) had a personal history of fragility fracture. 52 (25%) had a history of falls. Active smoking and alcohol consumption (>3 units per day) were more common in men (21% vs. 10%; p=0.03 and 11% vs. 4%; p=0.03 respectively). However the use of selective serotonin reuptake inhibitors was less frequent (8% vs 26% ; p=0.002). The use of proton pump inhibitors was common in both sexes (23%).
The prevalence of osteoporosis (T-score <-2.5) was higher in men (25% vs. 13%; p<0.05). Men had a higher prevalence of hip involvement (21% vs 7% at the neck and 15% vs 5% at the total hip). The highest prevalence of osteoporosis was observed in myeloma (46%), ovarian (23%) and lymphoma (18%). The youngest subjects in the cohort already had a significant prevalence of osteoporosis (15% under 40 years vs 13% [40-50[and 11% [50-60]).
Conclusions. The JUMP post-cancer cohort shows a high prevalence of osteoporosis, particularly in young men with a cumulative number of bone fragility risk factors. This bone fragility comes on top of the high risk of falling and should be recognised in post-cancer patients. The ultimate goal is to improve quality of life and autonomy during cancer remission.

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CHRONIC LOW BACK PAIN – APPROACH TO CONSERVATIVE THERAPEUTIC ATTITUDES IN GENERAL AND FAMILY MEDICINE

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SUMMARY:
Low back pain is the most common musculoskeletal disease, being considered the main cause of disability and absenteeism from work. It is recognized as the pathology that is expected to obtain the most benefit from rehabilitation treatments. Conservative treatments include different types of intervention, which aim at the functionality, independence and active participation of the patients. The aim of this literature review is to evaluate the role of conservative attitudes in the management of chronic low back pain, with regard to symptomatic control, functionality and the quality of life of these patients. A bibliographical research was therefore carried out in PubMed/ME-DLINE, Database of Abstracts of Reviews of Effects and The Cochrane Library, using the MeSH terms: “Chronic Back Pain” AND “Conservative Therapies”. It is concluded that the therapeutic exercise is considered the basis of the treatment of chronic low back pain. Of the articles that were analyzed, it is worth mentioning favourable data regarding pilates exercises in the pain control of chronic low back pain, resistance and spinal stabilization exercises in functionality, strength and muscular endurance, and aerobic exercises in mental health related to this pathology. Hydrotherapy has shown promising but meager results on pain intensity, associated disability, quality of life and sleep, and mental state. The results of acupuncture and electroacupuncture modalities, biofeedback therapy and laser therapy are still scarce.

Keywords: Chronic Low Back Pain; Conservative Treatment; General and Family Medicine.

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VITAMIN D LEVELS AMONG HEALTHCARE WORKERS

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Vitamin D deficiency is widespread in our country and around the world. Vitamin D is essential for human health and is synthesised in the body largely through exposure of the skin to sunlight. Working in environments with insufficient sunlight exposure may increase the risk of vitamin D deficiency. In this study, we hypothesised that vitamin D levels may be quite low in healthcare workers who work in buildings with insufficient sunlight and who work night shifts, and aimed to investigate the effects of working

environment and working hours on vitamin D levels in healthcare workers.
Methods: In this retrospective cross-sectional case-control study, 25OHD$_3$ levels of healthcare workers working in our hospital were collected from the hospital data system. According to the National Endocrine Society values, a serum 25OHD$_3$ level of <20 ng/mL was considered deficient, levels between 20-30 ng/mL as insufficiency and >30 ng/mL as normal. Healthcare workers were divided into occupational subgroups and serum 25OHD3 levels were compared.
Results: 25OHD$_3$ levels were measured in 1934 [male: 510 (26%), female: 1424 (74%)] healthcare workers. The mean age of the participants was F/M: 33/36 years.
The staff subgroups were distributed as follows 525 doctors [residents (265), specialists (218)]. 460 nurses, 321 allied health professionals, 198 clerical staff, 430 other staff. The mean 25OHD$_3$ index of all participants was 16.49ng/ml. There was no statistically significant difference between the 25OHD$_3$ levels of women (16.36 ng/mL and men (16.86 ng/mL according to gender (p>0.05). In the physician group, the overall mean 25OHD$_3$ level was 20.38 ng/mL(17.72ng/mL for residents and 23.37 for specialists). In the nurse group the mean 25OHD$_3$ level was 15.41ng/mL in the allied health personnel group was14.67ng/mL in the clerical personnel group was 17.39ng/mL and in the other hospital personnel group was 13.76 ng/mL
Conclusion: In our study, we found that 25OHD$_3$ levels of health care workers were very low. Since vitamin D deficiency is an easily preventable and treatable condition, the detection of this deficiency is of great importance.

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GLOBAL, REGIONAL AND NATIONAL BURDEN OF KNEE OSTEOARTHRITIS 1990-2021: A SYSTEMATIC ANALYSIS OF THE GLOBAL BURDEN OF DISEASE STUDY 2021

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Objective: The systematic analysis aimed to assess the levels and trends of knee osteoarthritis (KOA) in 204 countries and territories from 1990 to 2021.
Methods: We analyzed the data on the Global Burden of Diseases 2021 and reported the KOA burden and the trends from 1990-2021 by age-standardized incidence rate (ASIR), age-standardized prevalence rate (ASPR) and disability-adjusted life years (DALYs). All estimates were presented as counts and age-standardized rates per 100,000 people, calculating the estimating average annual percent change (EAPCs) with 95% uncertainty intervals (UIs).
Results: From 1990 to 2021, the KOA burden still showed an increasing trend globally, faster in females than males; the 35-39 years population has faster KOA symptoms, and 45-49 years have faster prevalence and DALYs. The high-middle SDI regions are experiencing the fastest increase. East Asia has the fastest growth, and North America has shown a stable trend with no change. The top 9 fastest growing countries and territories were Oman, Equatorial Guinea, Thailand, Saudi Arabia, Sudan, China, Taiwan (Province of China), Maldives, and Pakistan. By 2050 of prediction, there may be an obvious decreasing trend in KOA burden. Frontier analysis indicates the presence of unrealized opportunities to close the KOA burden gap in most countries and territories. Decomposition analyses indicate that population growth accounted for more than 70% of the global KOA burden. SDI level was positively associated with KOA burden increasing, and ASIR or HDI was not associated with the burden EPAC.
Conclusion: KOA is still a major global health challenge. Although there is variation between countries and regions, most countries' KOA burden is increasing, especially among females and young adults.

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THE ASSOCIATION BETWEEN ADMISSION TO OPERATION (ATO) TIME AND PREOPERATIVE DEEP VEIN THROMBOSIS (DVT) IN GERIATRIC HIP FRACTURE UNDER THE ANTICOAGULATION AND MECHANICAL THROMBOPROPHYLAXIS: A RETROSPECTIVE COHORT STUDY

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Objective: This study aimed to evaluate association between admission to operation (ATO) time and preoperative deep vein thrombosis (DVT) in geriatric hip fracture under the anticoagulation and mechanical thromboprophylaxis.
Methods: Geriatric patients with hip fractures were screened between January 2015 and September 2019. We collected the demographic information and DVT screening result in medical system. Multivariate binary logistic regression and generalized additive models were used to identify the linear and nonlinear associations between ATO and preoperative DVT. Also, we performed Propensity Score Matching (PSM) to test the robustness of our results in a real-world study.
Results: One thousand seven hundred and thirty-five patients were included in this study. There were 443, 726, and 566 patients in ATO≤2d, 2d<ATO≤4d, and ATO>4d groups, respectively. Preoperative DVT occurred in 543 (31.29%) patients. There was a "J" type in curve fitting, and the result shown that there was curvilinear relationship between ATO and preoperative DVT. ATO of 3 d was the inflection point. ATO increasing was not associated with increasing of preoperative DVT when ATO< 3d (OR=0.82; 95% CI: 0.66-1.02; *P*=0.0753), whereas ATO increasing was associated with DVT (OR=1.06; 95% CI: 1.00-1.13; *P*=0.0338) at ATO >3 d. In a real-world population of 1:1 under PSM, we found that the results were stable and the inflection point was same to total population.
Conclusions: ATO is nonlinearly associated with preoperative DVT in geriatric patients with hip fractures under the anticoagula-

tion and mechanical thromboprophylaxis. The 3 d was the important point in DVT formation, every one day increasing in ATO was associated with the rising 6% in incidence of preoperative DVT.

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OSTEOPOROSIS ASSOCIATED WITH A PLS3 GENE MUTATION: A CASE REPORT

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Osteoporosis (OP) is the most common metabolic bone disease, mainly affecting postmenopausal women but also occurring in younger individuals and men. Secondary OP may arise due to chronic conditions, medications, or alcohol use. In young adults with severe OP, multiple fractures, a family history of OP, and no clear secondary cause, monogenic bone diseases should be investigated. The prevalence of OP in young patients is underestimated, and management strategies remain unclear.

We report the case of a 42-year-old man with multiple fragility fractures since age 30. After a femoral neck and olecranon low-energy fracture, he initiated alendronate 70mg/week in 2013, for six years. Despite treatment, he sustained several additional fragility fractures: the right 5th metacarpal (2014), bilateral wrists (2015), and vertebral bodies T3 and T4 (2018). He was referred to rheumatology. He showed no stigma of osteogenesis imperfecta, and possible secondary OP causes were ruled out. A detailed family history uncovered a maternal uncle with multiple fragility fractures from a young age. Therapeutic failure was assumed, and therapy was switched to teriparatide 20mcg/day (2019–2021). Despite no significant improvement in bone density, the patient did not suffer further fractures. Zoledronate was used as sequential therapy. He was also referred to a clinical geneticist. A hemizygous c.342C>G (p.Ser114Arg) variant in the PLS3 gene was identified by genomic test.

The X-linked *PLS3* gene, primarily affecting hemizygous males, encodes Plastin-3, a protein with bone-regulatory properties. The exact mechanism by which *PLS3* mutations cause OP and fractures is unknown. Patients with *PLS3* mutations typically develop early-onset OP, making sequential treatment essential. However, current therapies are based on postmenopausal OP studies, highlighting the urgent need for research into the efficacy and safety of therapies in this population.

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DENOSUMAB AS A NEW THERAPEUTIC OPTION IN PAGET'S DISEASE OF BONE: A CASE REPORT

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Paget's disease of bone (PDB) is the second most prevalent metabolic bone disease. The clinical spectrum varies from asymptomatic to bone pain, deformities, or fractures. The principal marker for diagnosis and monitoring is alkaline phosphatase (ALP). First-line therapy is bisphosphonates (BPs), particularly zoledronate. BPs are contraindicated in glomerular filtration rate below 30mL/min. Even though few cases are described in the literature, denosumab appears to be an option for these patients.

We present a case of a 70-year-old man with a polyostotic PDB diagnosed in 2000, with involvement of the sacrum, iliacs, T11 and L1. He was treated with pamidronate (2000, 2003) and zoledronate (2009, 2011, 2015). He also had Crohn's disease, microcrystalline arthropathy, dyslipidemia, hypertension, chronic alcoholic liver disease, and chronic kidney disease, progressing to stage 4 by 2021. In March 2022, he developed a disabling low back pain, without response to analgesic treatment. A lumbar spine CT showed changes suggestive of PDB in L1 and L5. Nuclear bone scan showed heterogeneous radiopharmaceutical uptake consistent with reactivation of PDB. Analytically, he presented an increase in bone-specific ALP, serum ALP, beta-crosslaps and osteocalcin. Due to low renal clearance, he started treatment with denosumab 60mg every 6 months with complete resolution of pain after 2 weeks. The patient showed rapid analytic response, however, the ALP tended to increase when the next administration approached. This may suggest a rebound effect similar to the one observed in osteoporosis.

Zoledronate is the first-line treatment of PDB. Indications are less clear when there is intolerance or contraindication to BPs. Denosumab is a safe alternative for patients with renal impairment. To the authors' knowledge, there are no comparative studies between zoledronate and denosumab in PDB. In the literature, there are no studies indicating the frequency or duration of denosumab in PDB.

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PYROGENICITY ASSESSMENT OF CROSSLINKED HYDROGEL MICROPARTICLES (HMPS) UTILIZING THE RABBIT PYROGEN TEST IN ACCORDANCE WITH EUROPEAN PHARMACOPOEIA GUIDELINES

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Objective(s): To evaluate the safety profile of a biopolymer-based medical device designed for intra-articular administration in the treatment of joint pain and dysfunction. The primary objective

was to determine its non-pyrogenicity under controlled test conditions.
Material and Methods: The medical device, composed of highly purified biopolymers and intended for single-use intra-articular injection, was supplied in pre-filled, luer-lock syringes and sterilized via gamma irradiation. Three healthy New Zealand White rabbits (males, 2.3–3.1 kg) sourced from Charles River Laboratories, France, were housed under standardized conditions (temperature: 17–21°C; relative humidity >30%) as per EU Directive 2010/63.
Following acclimatization, a pyrogen test was performed. The test article was extracted at 37°C ± 1°C for 72 hours, homogenized, and administered intravenously via the marginal ear vein at 10 mL/kg body weight. Rectal temperatures were recorded every 30 minutes for 3 hours post-injection. Results were assessed against European Pharmacopoeia thresholds for pyrogenicity.
Results: The maximum cumulative temperature rise across the three rabbits was 0.64°C, significantly below the 1.15°C threshold indicative of pyrogenic activity. The extract's pH was 6.0, and the supernatant, following centrifugation, was cloudy but free of visible particulates. No adverse clinical observations or deviations were recorded during the study period.
Conclusion(s): Under the conditions of this study, the medical device was determined to be non-pyrogenic, meeting the requirements of the European Pharmacopoeia. These findings support its safety profile for intended therapeutic applications.
Acknowledgments: The study was conducted at NAMSA, an AAALAC International-accredited facility, with oversight by the NAMSA Ethical Committee and the French Ministry of Education, Higher Education, and Research. The contributions of trained personnel and strict adherence to standardized protocols ensured reliable data.
Disclosures: No sedation, anesthesia, or analgesia was used during the study. Results apply solely to the specific test article under the stated conditions.

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EVALUATION OF THE RELATIONSHIP BETWEEN VITAMIN D LEVELS AND BONE MINERAL DENSITY, FRACTURE RISK, AND MUSCLE STRENGTH IN THE GERIATRIC AGE GROUP

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Introduction and Aim: Vitamin D has a direct effect on bone health and muscle functions. Vitamin D deficiency may result in decreased bone mineral density and decreased muscle strength. The goal of our study is to investigate the correlation between vitamin D levels, bone mineral density, muscle strength, and fracture risk within the geriatric population.
Materials and Methods: Data of patients applying to the Ankara University Faculty of Medicine Geriatrics Department between January 2021 and December 2023 will be retrospectively analyzed. The vitamin D levels, grip strength, and FRAX scores of the included patients will be examined in the study.
Results: 192 participants were included in the study. Of these, 61.5% were female, with an average age of 78.1 years. Significant differences were observed in muscle strength between the sufficient and low vitamin D groups (p<0.001). In the sufficient vitamin D group, higher MNA total scores (p=0.037) and lower GDS scores (p=0.007) were noted. Femoral neck BMD values and T scores were also significantly higher in the sufficient vitamin D group (p=0.022, p=0.020). While no significant difference was found in FRAX fracture risk between the two groups, a significant negative correlation was observed between vitamin D and 10-year major osteoporotic (p=0.003) and hip fracture (p=0.014) risks. Positive correlations were also observed between vitamin D and femoral neck (p=0.004) and lumbar (p=0.019) T scores. Positive correlations were found between vitamin D levels and Katz (p=0.008), Lawton (p=0.006), MNA (p=0.03) scores, while negative correlations were observed with GDS (p=0.004) and FRAIL (p=0.028) scores.

	Vitamin D ≥ 20 n=85	Vitamin D < 20 n=107	p value
Femoral neck BMD, *g/cm²*	0.79±0.15*	0.74±0.15*	**0.022**
Femoral neck T score	-0.8±1.1*	-1.2±1.2*	**0.020**
FRAX, 10 year probability of fracture (%)			
Major osteoporotic	7.1±4.9*	8.5±5.9*	0.061
Hip fracture	2.1±1.8*	2.8±2.8*	0.088

**mean ± SD*

Conclusion: Adequate vitamin D levels were associated with increased muscle strength, higher BMD values, and decreased fracture risk. Maintaining adequate vitamin D levels is important for bone health and adequate muscle strength. Additionally, vitamin D may have an impact on increased daily life activities and decreased depression scores outside the musculoskeletal system.

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REAL-WORLD EFFECTIVENESS OF ROMOSOZUMAB: A SYSTEMATIC LITERATURE REVIEW

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Objectives: To summarize observational, real-world evidence for use of romosozumab.
Material and Methods: A systematic literature review was conducted according to PRISMA guidelines. MEDLINE, Embase and relevant conference proceedings were searched to 2nd December 2024 for observational studies of patients receiving romosozumab reporting effectiveness outcomes.
Results: The SLR identified 362 records, of which 67 unique studies across 10 countries were included. The majority were retrospective cohort studies (n=39) and 29/67 were comparative. Numbers of patients ranged from six to 29,512 for romosozumab

and 21 to 537,927 for comparators, with denosumab most commonly reported. Mean patient age ranged from 52.3 to 84.4 years. Across both romosozumab and comparator arms, mean bone mineral density (BMD; T-score) at baseline ranged from −3.80 to −1.79 at the lumbar spine, −3.00 to −2.15 at the total hip, and −3.30 to −2.20 at the femoral neck. Mean percentage change in lumbar spine BMD at 12 months ranged from 0.97% to 20.0% and 1.07% to 8.10% for patients treated with romosozumab and comparators, respectively. Mean percentage change in total hip BMD ranged from −0.40% to 9.10% (romosozumab) and −2.80% to 3.60% (comparators) with similar changes in femoral neck BMD. Romosozumab was associated with significant improvements in BMD at 12 months versus baseline in 25/25 (lumbar spine), 18/22 (total hip) and 16/18 (femoral neck) studies. BMD gains in treatment-naïve patients were significantly larger compared with previously treated patients, in 11/12 (lumbar spine), 7/10 (total hip) and 5/8 (femoral neck) studies.

Conclusions: Across real-world data romosozumab improved BMD and demonstrated larger BMD gains versus comparators at 12 months. However, effectiveness was reduced in those previously treated with osteoporosis medications, highlighting the importance of treatment sequencing.

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Disclosures:

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MMC: Consulting fees and/or honorarium from Amgen, Pfizer and UCB.

KE: Received fees and honoraria for lectures from Amgen and UCB.

JS: Employed by Costello Medical.

SC: Employed by and stockholder of Amgen.

JT: Employed by and stockholder of UCB.

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ASSESSING THE EFFICACY AND SAFETY OF ROMOSOZUMAB IN POSTMENOPAUSAL OSTEOPOROSIS: AN UPDATED SYSTEMATIC REVIEW AND META-ANALYSIS

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Objective: This meta-analysis aimed to study the effects of romosozumab in postmenopausal women compared with other interventions, evaluating changes in bone mineral density (BMD), incidence of new vertebral fractures, bone biomarkers, and safety.

Material and Methods: A systematic search was conducted using three databases. Randomized controlled trials (RCTs) evaluating romosozumab in postmenopausal patients with osteoporosis were included. The main variables were BMD, incidence of new vertebral fractures, bone formation, and removal of markers and adverse events. Sensitivity analyses and GRADE assessments were conducted to ensure the robustness and certainty of the finding.

Results: Ten RCTs with 15,476 patients were included. Romosozumab demonstrated significantly greater improvements in lumbar spine BMD than placebo (MD 13.18, 95% CI 11.91 to 14.45; P < 0.00001), denosumab (MD 5.29, 95% CI 4.20 to 6.37; P < 0.00001), teriparatide (MD 4.35, 95% CI 4.09 to 4.61; P < 0.00001), and alendronate (MD 9.95, 95% CI 7.51 to 12.40; P < 0.00001). Romosozumab also showed higher levels of the bone formation marker P1NP than denosumab (MD -1.10, 95% CI -1.38 to -0.81; P < 0.00001) and alendronate. The safety profile of romosozumab was comparable to the comparator interventions.

Conclusions: This comprehensive meta-analysis provides robust evidence that romosozumab is an effective and safe treatment option for postmenopausal osteoporosis, with superior effects on BMD and bone formation biomarkers compared with other interventions. These findings support the use of romosozumab to improve clinical outcomes in this patient population.

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SAFETY AND OUTCOMES OF ROMOSOZUMAB IN ONCO-HEMATOLOGIC PATIENTS: A MULTICENTER STUDY FROM TWO SPANISH HOSPITALS

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INTRODUCTION AND OBJECTIVES:

The use of Romosozumab, with dual osteogenic and antiresorptive effect, has demonstrated in clinical trials its efficacy and safety for the treatment of osteoporosis (OP). Strict inclusion criteria may limit study populations, such as onco- haematological patients The aim of the study was to describe the demographic, clinical and densitometric characteristics of two cohorts of patients with a diagnosis of solid organ or haematological neoplasia in clinical remission

MATERIAL AND METHODS:

This is a retrospective cohort study which included patients with onco-haematological neoplasia assessed in the bone metabolism consultation of the Hospital Clínico Universitario de Valencia and the Hospital Universitario Son Llàtzer, treated with romosozumab from October 2022 to December 2024. Clinical and analytical data, fracture types, treatments and densitometric data were collected before and after the end of treatment. Safety has been assessed by assessing the need and cause for treatment discontinuation.

RESULTS:

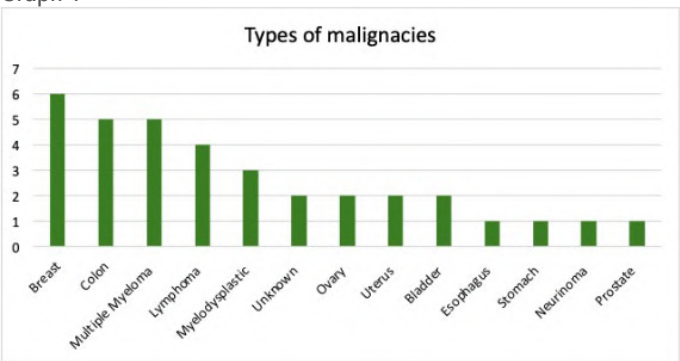
35 patients were included being 26 women (74.29%) with a me-

dian age 78 ICR (71-83). The distribution of comorbility was :Diabetes mellitus 25,71% Hypertension 37,14% Dislipidemia 34,29% Chronic kidney disease 20% . The type of onco-haematological malignancies is described in graph 1.
Romosozumab was prescribed as secondary prevention in 88.57% (n: 31), the distribution of fracture types present in both cohorts is shown in graph 2. The prior treatment received by patients : Zaledronate (4) Teriparatide (4) Alendronate (3) Denosumab (3) Risedronate (2)
15 patients have control densitometry after finish of romosozumab. The mean densitometric T-score values are shown in graphs 3 and 4, where statistically significant differences are observed after romosozumab use.
No patients discontinued treatment due to adverse effects or drug interactions.No cardiovascular events occurred.

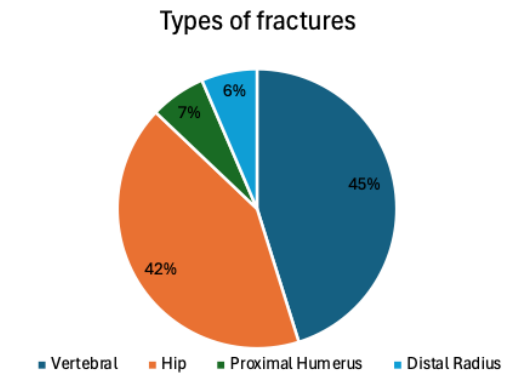
CONCLUSIONS:

In conclusion, we can state that romosozumab in routine clinical practice is a good therapeutic option in onco-haematological patients with very high-risk of fracture with a high degree of adherence, as well as a good safety and tolerability profile.
Disclaimer : Romosozumab is not approved on technical data sheet in men nor in oncohematological patients . The use in these patients , both male and female , was medically decided in the absence of other options.

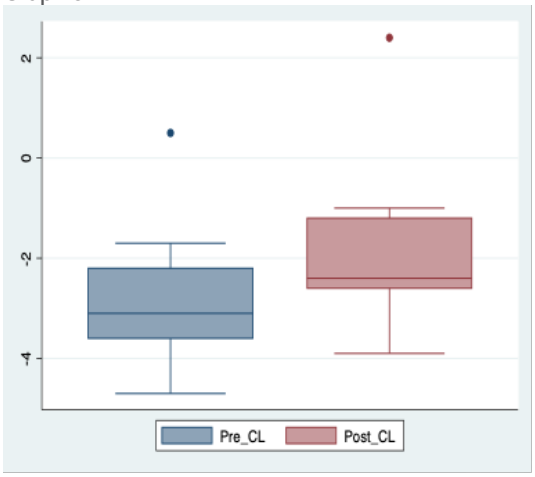
Graph 1



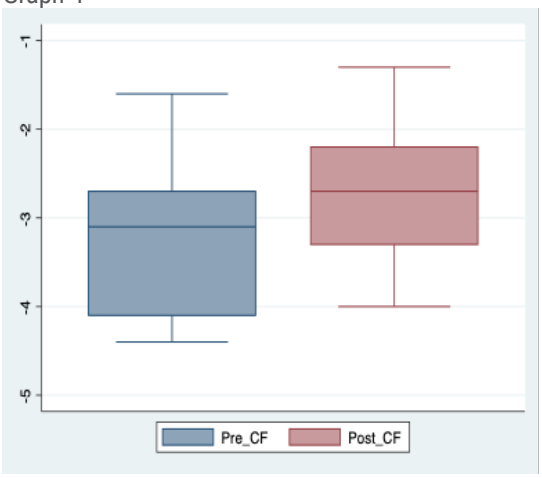
Graph 2



Graph 3



Graph 4



P300

CAUSES OF BIOTHERAPY DISCONTINUATION IN RHEUMATOID ARTHRITIS

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Introduction: The advent of biotherapies has revolutionized the management of chronic inflammatory rheumatic diseases; however, in some situations, their temporary or definitive discontinuation is necessary.
Aim:
The aim of our study is to analyze the reasons for discontinuation of biotherapies in rheumatoid arthritis.
Materials and methods :
We retrospectively analyzed the files of patients with rheumatoid arthritis (RA) treated with biotherapies between 2000 and 2021. We have recorded the epidemiological characteristics, the indications for biological treatment, the duration of treatment and the reasons of discontinuation.
Results :
One hundred and eighteen patient records were analyzed (99

women and 19 men). The mean age of our population was 56.86 ± [28-81 years].Anti TNF ά was prescribed in 67 cases: Infliximab in 27 cases, etanercept in 16 cases, certolizumab in 13 cases, adalimumab in 9 cases and golimumab in 2 cases. As for anti Il6 and anti CD20, they were prescribed in 24 and 27 cases respectively. Discontinuation of biotherapy was indicated in 54 cases. Anti TNF was suspended in 37 cases (68.51%), anti CD20 in 15 cases (27.7%) and anti IL6 in 2 cases (3.7%). As for the anti TNF, infliximab was suspended in 19 cases, etanercept in 10 cases, adalimumab in 4 cases, certolizumab in 3 cases and golimumab in 1 case.The causes of discontinuation were dominated by the occurrence of adverse effects in 56% of cases, such as infection in 57 cases (48.3%), skin reaction in 4 cases (3.4%), and systemic allergic reaction in 2 cases (1.7%), two cases of neutropenia(1.7%) and one case of hepatic cytolysis(0.8%).Drug discontinuation rates due to lack of effectiveness were observed in 54 cases.
Conclusion :
Biotherapies have transformed the prognosis of refractory forms of RA. The frequency and severity of adverse effects of these molecules can be reduced by respecting the pre-therapeutic assessment, rigorous patient education and careful follow-up.

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MODALITIES OF METHOTREXATE USE IN RHEUMATOID ARTHRITIS BEFORE THE INITIATION OF BIOTHERAPY

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Objective :
Methotrexate (MTX) remains the cornerstone of rheumatoid arthritis (RA) treatment, as evidenced by guidelines that indicate MTX as first-line therapy for most newly diagnosed patients. Optimization of MTX prior to initiation of biologic therapy is necessary in the management of RA. The aim of this study was to evaluate the use of MTX prior to biologic therapy in RA.
Material and methods :
This is a retrospective study that included patients followed for RA, treated with MTX for at least 3 months and requiring the use of biological treatments.
Results :
One hundred seven patients were included, 13 men and 94 women. The mean age was 55.71 years [28-81 years].MTX was prescribed as first-line oral therapy for all patients. The initial dose prescribed was 10mg/week for 24 patients (22.4%), 12.5mg/week for 4 patients (3.7%), 15mg/week for 54 patients (50.5%) and 17.5mg/week for one patient (0.9%).The highest prescribed dose of MTX was 25mg/week in one patient. 24 patients (22.4%) were prescribed a dose greater than or equal to 20mg/week. This maximum dose was prescribed after an average of 32 months. A switch to the parenteral form was made in 18 patients (16.82%) whose main indication was digestive intolerance (41.12%). A second synthetic treatment (csDMARDs) in combination with MTX was used in 75 patients (70.1%): Salazopyrine in 74 patients and leflunomide in one patient (0.9%). The mean duration of MTX therapy before initiation of the first biologic was 56 months. MTX was discontinued before one year in 20 patients (18.7%). The reasons for discontinuation of MTX were: digestive and neurosensory intolerance in 10 patients (9.3%), hepatic cytolysis in 2 patients (1.9%), leukopenia in one patient (0.93%), and toxidermia in one patient (0.93%).
Conclusion :
Our study shows that there are some deficiencies in optimizing of MTX prior to the use of biotherapy in the management of RA, including a delay in the instauration of an effective dose.

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EPIDEMIOLOGICAL ,CLINICAL AND EVOLUTIONARY ASPECTS OF GAMMAPATHIES OF UNDETERMINED SIGNIFICANCE IN THE ELDERLY

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Objective :
Monoclonal gammopathies are a group of disorders caused by abnormal plasma cell proliferation. Monoclonal gammopathies of undetermined significance (MGUS) represent the most frequent etiology. They are characterized by the presence of a plasma cell clone in the bone marrow, secreting a monoclonal immunoglobulin in the blood or urine, with no clinical or laboratory signs of malignant lymphoproliferation. MGUS is characterized by its asymptomatic nature and its incidental discovery in the majority of cases. It is a biological abnormality frequently found in the general population, particularly in the elderly, and its incidence is estimated at 3.5% in patients over 70.
Our aim is to describe the epidemiological, clinical and evolutionary aspects of MGUS in elderly subjects.
Material and methods :
This is a retrospective study conducted in the Clinical Hematology and Rheumatology Department of the Fattouma Bourguiba University Hospital (CHU) in Monastir over an 8-year period (from 2012 to 2020).
Results :
We identified 32 patients with MGUS, with a predominance of female and a sex ratio of 0.68. The age of our patients ranged from 65 to 88 years, with an average of 74 ±5 years. Twenty patients (62%) had more than two comorbidities, including 40% with diabetes and hypertension. MGUS was associated with rheumatological and autoimmune diseases in 25% and 6.25% of cases respectively. Six patients had an autoimmune disease: four had rheumatoid arthritis, one had autoimmune hepatitis and one had primary Gougerot Sjögren's syndrome. The two most frequent circumstances of discovery were: incidental finding in 30.7% and bone pain in 40.6% . Isolated anemia was observed in 12 cases (37.5%). No patient had thrombocytopenia or leukoneutropenia. The erythrocyte sedimentation rate (ESR) was accelerated in 6 cases (18.8%). CRP was negative in 29

patients (90%), and blood calcium and LDH levels were normal in all. Four patients (12.5%) had renal failure of the following etiology: Diabetic nephropathy and Nephro-angiosclerosis. The proteinuria was positive in 4 patients (12.5%). Six patients (18.8%) had hypoalbuminemia. Hypogammaglobulinemia was observed in 7 patients (21.9%), and the monoclonal peak was found in the Gamma and Beta zones respectively in 81% and 16% of EPPs requested. Monoclonal peak values ranged from 3g/l to 16g/l, with an average of 7g/dl ±3g/l. Non-IgM MGUSs represented the highest proportion of the total. Non-IgM MGUS accounted for 84.4% of cases. IgM MGUS was found in 5 patients (15.6% of cases). None of the patients included had Ig E, Ig D or light chain MGUS. All patients (100%) underwent a myelogram, and the rate of bone marrow plasmacytosis ranged from 0 to 8%, with an average of 3 ±1%. 1 patient (3.1%) underwent FISH karyotyping, which revealed no chromosomal abnormalities. Patient follow-up ranged from 0 to 9 years, with an average of 2 years. One case transformed into Indolent Multiple Myeloma with the following characteristics: Age at diagnosis:87 years, Duration of surveillance: 2 years, Initial peak size: 16g/l ,Ig Isotype: IgG, Percentage of Initial Plasmocytosis 7%.
Conclusion :
These results highlight the importance of performing a complete workup in the event of detection of a monoclonal peak on plasma protein electrophoresis (PPE), to ensure the absence of multiple myeloma or another lymphoproliferative pathology, and to anticipate possible clinical evolutions. A prognostic score can be calculated to better stratify the risk of transformation and adapt the rhythm and modalities of monitoring.

P303

FIRST LINE PHYSICIANS KNOWLEDGE AND PRACTICES REGARDING CHRONIC INFLAMMATORY RHEUMATIC DISEASES (CIRD)

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Objective:
Chronic inflammatory rheumatic diseases (CIRD) represent a major challenge in the management of patients by primary care physicians. The aim of this study is to assess the knowledge and practices of Tunisian general practitioners in terms of CIRD, as well as their training needs in relation to these diseases.
Material and methods :
A self-administered survey developed via Google-Forms was conducted among Tunisian primary care physicians in 2024.
Results :
Sixty-two physicians were included in our study: 35% men and 65% women. The mean age of the participants was 31 years [28-40 years]. Eighty percent of them worked in public health and 20% were self-employed, with an average number of years of practice of 2.9 years [1-13 years]. All the doctors questioned declared that they received patients with CIRD in consultation, with a frequency of less than five patients per month for 60% of them, between five and ten patients per month for 20%, and a frequency of more than 10 patients for the remainder (20%). The most common CIRD were rheumatoid arthritis (RA) in 92.5% of cases, spondyloarthropathy (SPA) in 27.5% and psoriatic arthritis (PsA) in 10%. RA was suspected in the presence of joint deformities (82.5%), polyarthralgia (77.5%) and polyarthritis (65%). SPA was suspected in the presence of rachialgia (72.5%) and association with chronic inflammatory bowel disease (45%). Ninety seven percent of doctors asked for a biological work-up in the case of suspected CIRD, and all doctors asked for standard X-rays, such as hand X-rays (87.5%) and forefoot X-rays (60%) in the case of RA, along with lumbar and cervical spine X-rays (80%) and pelvic X-rays (67.5%) in the case of SPA . When it came to screening for extra-articular manifestations, 60% thought it should be done systematically, and 40% did so only in the presence of warning signs on examination. Sixty-five per cent said they had difficulty diagnosing CIRD , and 35% did not. The sources of information in this case were calls to specialists (70%), continuing medical education (37.5%), medical websites (32.5%) and literature reviews (10%). Training in the management of CIRD was judged sufficient by 22.5%, superficial by 60% and very inadequate by 17.5%. 95% of them would like more training in inflammatory joint pathology. They referred patients to rheumatology immediately (22.5%), in the absence of improvement with symptomatic treatment (60%) and in extreme age groups (15%).
Conclusion :
The survey reveals a good awareness of the clinical signs of CIRD among primary care physicians, but highlights shortcomings in diagnosis and follow-up, as well as a significant need for further training to improve the management of patients suffering from these conditions.

P304

BIOTHERAPY IN ELDERLY PATIENTS WITH RHEUMATOID ARTHRITIS : EFFICIENCY AND TOLERANCE

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Objective:
Due to the exponential increase of biotherapies and their indications, several studies have been carried out to evaluate their impact on elderly patients suffering from autoimmune disease.The treatment of rheumatoid arthritis (RA) in the elderly, particularly by biotherapy, is made more difficult by the presence of associated pathologies and by the increase in side effects.
The aim of our work is to determine the frequency of biological treatment in elderly patients in a rheumatology department, and to reveal the clinic-biological profile of these patients, as well as the efficacy and tolerance of the prescribed treatments.
Material and methods :
This is a retrospective study including the records of patients over 65 years old followed up for RA according to the ACR/EU-

LAR 2010 criteria for RA in a rheumatology department and who were treated with biotherapy during the period between 2000 and 2021.
Results :
Among the 118 patients included, 33 patients were older than 65 years, a frequency of 23.9%. The mean age was 70.21 ±3.64 years [65-81 years old]. The sex ratio (M/F) was 0.27. The mean duration of evolution was 13 years [6-22 years]. The associated comorbidities were dominated by hypertension 42.4 in % of cases and diabetes in 57.6 %.Prior to the initiation of biologic therapy, almost all RA patients had received methotrexate (MTX) (81.8%), dual therapy with MTX and salazopyrin in 48.4 %, and triple therapy with MTX, salazopyrin, and plaquenil in 16.1%. Switching to biotherapy was indicated following failure of csDMARDS in 60.6 % of cases, for intolerance to csDMARDS in 51.5 % of cases, or for contraindication to csDMARDS in 10 % of cases. The mean initial DAS28 was 5.66 ± 1.06 [3.43-7.4] and the mean DAS28 at 12 months was 3.53 ± 1.56 [0.4-7]. 78.8 % of patients had a therapeutic response at 12 months, among them 36.4% had a moderate response and 42.4% had a good response. The first-line biotherapies used were anti TNFά in 18 cases (54.5%) (Infliximab in 12 cases(36.4%), Etanercept in 4 cases (12.1%), Adalimumab and Certolizumab in 1 case each (3%)), rituximab in 11 cases (33.3%%)and anti IL6 in 4 cases(12.1%). Drug retention rates were as follow: anti TNF with a rate of retention of 44.11± 28.13 months; anti IL6: 33.55±10.34 months and anti CD20:23±13.65 months. The bivariate analysis did not reveal any statistically significant factor associated with therapeutic response. Among our patients, 30.3% had a good tolerance to the biotherapies, but 69.7% presented adverse events dominated by infections in 63.6%, in particular respiratory infections (10 cases), urinary tract infections (9 cases) and cutaneous infections (6 cases).
Conclusion :
The efficiency and tolerance of biologic background treatments seem to be adequate and comparable to those of young patients. However, rigorous monitoring of elderly patients is still necessary due to the fragility of the terrain and the frequency of comorbidities that can condition the appearance of adverse effects under biotherapy.

P305
OSTEOARTICULAR MANIFESTATIONS OF SARCOIDOSIS

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Objective :
Sarcoidosis is a multisystem granulomatosis that can affect all organs, with thoracic involvement being the most common and suggestive. Osteoarticular manifestations are rarely the initial presentation and are often misleading. Our objective was to describe the clinical, paraclinical, therapeutic, and evolutionary aspects of sarcoidosis in a rheumatological setting.
Material and methods :
This is a retrospective study of 15 cases of sarcoidosis collected in the Rheumatology Department of Farhat Hached Hospital in Sousse between 1997 and 2022. The diagnosis of sarcoidosis was established either based on a positive biopsy or the presence of Löfgren's syndrome.
Results :
The mean age was 47 years [32–70 years], with a sex ratio of 0.16 (13 women and 2 men). The average diagnostic delay was 13 months.The osteoarticular manifestations were : arthritis in 9 patients (polyarthritis in 7 patients, mono- and oligoarthritis in 2 patients), primarily affecting the ankles (n=8),inflammatory arthralgia in 3 patients,back pain in 2 patients and dactylitis in 1 patient. The extra-articular manifestations were observed in 9 patients: Löfgren's syndrome (n=6), dyspnea with cough (n=3), and hepatomegaly with splenomegaly (n=1). A biological inflammatory syndrome was noted in 11 patients, with an average ESR of 63 mm/h. Hypercalcemia at 2.84 mmol/L was observed in 1 patient. The angiotensin-converting enzyme (ACE) level was elevated in 3 patients.On imaging: the X-rays were normal in 13 patients,destructive involvement with multiple geodes in the hands was observed in 1 patient,destructive involvement of the tarsus was identified on MRI in another patient and standard chest X-rays and CT scans (n=13) revealed mediastino-pulmonary lesions: stage I in 10 patients and stage II in 3 patients .A biopsy of the accessory salivary glands (n=10) confirmed sarcoidosis in 9 patients.On the therapeutic level:corticosteroids at an average dose of 15 mg/day [10–40 mg/day] was administered to 9 patients.The progression was characterized by improvement in osteoarticular symptoms in 9 patients, while 6 patients experienced relapses of joint flare-ups.
Conclusion:
The osteoarticular manifestations of sarcoidosis are polymorphic and non-specific, highlighting the need to consider it in any joint involvement associated with suggestive extra-articular features such as erythema nodosum or the presence of lymphadenopathy.

P306
MORPHO-FUNCTIONAL EVALUATION OF FOOT INVOLVEMENT IN CHRONIC INFLAMMATORY RHEUMATIC DISEASES: COMPARATIVE STUDY BETWEEN RHEUMATOID ARTHRITIS AND SPONDYLOARTHRITIS

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Introduction: Foot involvement is a key feature in chronic inflammatory rheumatic diseases (CIRD), including rheumatoid arthritis (RA) and spondyloarthritis (SpA), due to its frequent and often early occurrence, observed in approximately 75% of cases.
Objectives: To compare the morphological and functional foot alterations in patients with RA and SpA.
Methods: This was a cross-sectional study including patients fol-

lowed in a rheumatology department with RA according to ACR/EULAR 2010 criteria or SpA according to ASAS 2009 criteria over a two-month period. Patients were divided into two groups: RA and SpA. Sociodemographic and clinical data were collected. Each patient underwent a podoscopic examination using a podoscanner (DiasuPodoscan). Plantar footprints were analyzed using software for plantar morphometric assessment. The parameters studied included foot arch, maximum detected height, foot type, Arch Index, and global biomechanical postural index.

Results: Fifty-two patients were included: 32 in the RA group (mean age: 59.7±16 years) and 20 in the SpA group (mean age: 50±9.6 years). The SpA phenotype was axial in one patient, axial and peripheral in 27.1%, and peripheral in 8.3%. Among functional complaints, heel pain was more frequent in the SpA group, while metatarsalgia was more common in the RA group, with statistically significant differences between groups (p=0.01 and p=0.047, respectively). Regarding plantar footprint analysis, the foot arch was physiological in 57.1% of RA patients and 73.7% of SpA patients, with no significant difference. A square foot shape was observed in 57.1% of RA patients and 42.1% of SpA patients. Plantar morphometric analysis revealed a mean maximum foot height of 1±0.53 in the RA group and 1.24±0.6 in the SpA group. The total foot perimeter was 33.1±4 in the RA group versus 35.8±5.8 in the SpA group. The total foot volume had a median of 1.04 [0.4–1.7] in the RA group and 1 [0.4–2.1] in the SpA group. The global biomechanical postural index was 15.2±7 in the RA group and 14.3±8 in the SpA group, with pathological values observed in 48.3% of RA patients and 42.1% of SpA patients. No statistically significant differences were found between the two groups for these parameters. However, a pathological foot arch was significantly associated with the presence of metatarsalgia (p=0.021).

Conclusion: A detailed evaluation of plantar involvement could be useful in clinical practice to optimize management strategies for static disorders in patients with chronic rheumatic inflammatory diseases.

P307

SLEEPLESS WITH SPONDYLOARTHRITIS: UNVEILING THE PREVALENCE AND KEY DRIVERS OF SLEEP DISORDERS

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Introduction: Spondyloarthritis (SpA) is a chronic inflammatory rheumatic disease that can lead to significant functional impairment and reduced quality of life, including poor sleep quality.

Objectives: The aim of this study was to evaluate the prevalence of sleep disorders in patients with SpA and identify associated factors.

Methods: A cross-sectional study was conducted in a rheumatology department. Patients diagnosed with SpA according to the ASAS 2009 criteria were included. Sociodemographic, clinical, and paraclinical data were collected. Each patient completed the ASQoL questionnaire to assess quality of life (QoL) (score ranging from 0 [good QoL] to 18 [poor QoL]). Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI).

Results: Thirty-six patients with SpA were included. The mean age was 42.6±12.5 years, with a male predominance (64.4%). The mean disease duration was 12.4±3.5 years, and 40% of patients had coxitis. The mean BASDAI was 4.5±2.3, and the mean BASFI was 4.6±2.2. The mean pain VAS was 24.12±10.4.

Regarding sleep quality assessment using the PSQI, the mean global score was 12.5±2.5 [7–25]. The mean scores for specific components were as follows: "subjective sleep quality" 1.9±0.6, "sleep latency" 2±0.7, "sleep duration" 2.3±0.6, "habitual sleep efficiency" 1.9±0.7, "sleep disturbances" 1.7±0.7, "use of sleeping medication" 0.4±0.5, and "daytime dysfunction" 2.1±0.6. The mean ASQoL score was 7.8±3.6.

Sleep disorders were significantly associated with the presence of coxitis (p=0.001) and nocturnal awakenings (p=0.007). Moreover, the PSQI score was correlated with BASDAI (p=0.01), ASQoL (p<0.01), and pain VAS (p=0.04).

Conclusion: Sleep disorders appear to be frequent and contribute to reduced quality of life in SpA, particularly in cases of active disease and the presence of coxitis.

P308

SLEEP DISORDERS IN RHEUMATOID ARTHRITIS: PREVALENCE AND ASSOCIATED FACTORS

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Introduction: Sleep disturbances are frequently reported by patients with chronic conditions and are associated with a decrease in quality of life, psychological disorders, and increased morbidity and mortality. In rheumatoid arthritis (RA), chronic pain, functional disability, and joint stiffness can significantly affect sleep quality.

Objectives: The aim of this study was to determine the prevalence of sleep disorders in patients with RA and identify the associated factors.

Methods: This is a descriptive and analytical cross-sectional study. Patients diagnosed with RA according to the ACR/EULAR 2010 criteria were included. Data on patient characteristics and disease-related factors were collected. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI), while daytime sleepiness was evaluated with the Epworth Sleepiness Scale. The analysis was performed using SPSS software.

Results: Forty-two patients with RA were included, with a female predominance in 69% of cases. The mean age was 54.2 ± 9.8 years. The mean disease duration was 8.2 years [1–40]. The mean DAS28-CRP score was 4.1 ± 1.4 [1.75–8.2] and the mean HAQ score was 0.8 ± 0.6 [0–2.9].

Regarding sleep quality, the mean global PSQI score was 12.2 ± 2.9 [7–23]. The mean scores for the components were: subjective sleep quality (1.9), sleep latency (1.7), sleep duration (2.2), habitual sleep efficiency (1.2), sleep disturbances (1.7), use of sleep medication (0.6), and daytime dysfunction (2.0). The mean Epworth score was 6.6 ± 3.5 (range 3–20), with 26.1% of patients reporting sufficient sleep, 21.4% reporting improveable sleep quality, 11.9% having excessive daytime sleepiness, and 7.14% having very severe daytime sleepiness.
When evaluating sleep disorders based on disease activity, 42% of patients with active disease (DAS28 > 3.2) had sleep disturbances compared to 24.5% in those with low disease activity or remission, with a statistically significant difference ($p = 0.02$). Furthermore, the PSQI score was significantly correlated with the DAS28 ($p < 0.001$) and VAS pain ($p = 0.013$). The Epworth score was significantly correlated with the HAQ ($p = 0.025$) and nocturnal awakenings ($p < 0.001$).
Conclusion: Proper evaluation and management of sleep disorders in RA patients should be integrated into routine follow-up care to improve their quality of life.

P309

NON-FUNCTIONING PITUITARY ADENOMA AND OSTEOPOROSIS: A CASE REPORT

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Mrs. Maria (75 years old, menopause at 47, BMI 24 kg/m^2) was admitted to the internal medicine department because of hyponatremia (Na 125 mmol/L), nausea, dizziness and falls at home. Her medical history included arterial hypertension, gastroesophageal reflux, chronic treatment with antihypertensives and benzodiazepine. A brain CT scan revealed a sellar lesion. MRI showed a 14 mm pituitary adenoma with deviation of the anterosuperior stalk. The patient had been complaining of asthenia, loss of appetite and weight loss for a year. She did not have clinically detectable visual disturbances and defects in her visual field. Blood chemistry analysis showed anterior hypopituitarism: fT3 1.67 pg/ml [2-4.4], fT4 0.8 ng/dl [0.93-1.7], TSH 0.91 IU/L [0.27-4.0], FSH 2.8 IU/L, LH 2.3 IU/L, cortisol a.m. 7 µg/dl [6.0-18.4], ACTH 20 ng/l [4.7-48.8], IGF-1 39 mcg/L [60-190] and modest hyperprolactinemia (PRL 129 mcg/L [4.8-23.3]). Replacement therapy with levothyroxine 25 mcg o.d. and cortone acetate 12.5 mg o.d. was introduced and a low-dose of cabergoline (0.25 mg weekly) was started. DXA showed lumbar osteoporosis (T-score -3.0 SD) and femoral osteopenia (T-score femur neck -2.1 SD); x-rays showed a moderate D12 fracture on vertebral morphometry. Phosphocalcium metabolism tests showed normocalcemia, hypovitaminosis D (18 ng/ml), normal B-ALP and CTX (0.40 ng/ml). Anti-osteoporotic therapy was started with denosumab 60mg every 6 months and cholecalciferol 25.000 IU every 15 days. Three months later, PRL was very low (2 µg/l) and cabergoline was first reduced, then stopped. But 6 months after the first MRI, a new examination showed an increase in the size of the lesion to 16 mm with initial compression of the optic chiasm. Subsequently in Neurosurgery the adenoma was completely removed transnasally without complications (immunohistochemical examination was negative for PRL). Three months later, the improvement in plasma fT4, IGF-1 and cortisoluria allowed the replacement therapy (L-T4 and cortone) to be gradually stopped. After 12 months a new DXA showed bone densitometric improvement both at lumbar (BMD +5%) and femoral (+3%) level; no new fractures were reported at vertebral morphometry.

P310

OSTEOPOROSIS IN A 37-YEAR-OLD WOMAN DUE TO HIGH PARATHYROID HORMONE LEVELS

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Osteoporosis is a metabolic bone disease characterized by low bone mass and increased risk of fractures, which occurs more frequently in postmenopausal women. The presence of fragility fractures with high mortality and morbidity characterizes severe osteoporosis. We will present the case of a 37-year-old woman who, one month after experiencing back pain, presented to her family doctor, was referred to a rheumatologist, and after performing an MRI of the thoracolumbar region, was found to have a Th12 fracture. Laboratory tests and a DEXA scan were requested. Despite her young age, she had osteoporosis in the lumbar region with a T score of -2.9 and a femur T score of -1.7. Laboratory tests revealed a high PTH of 107 pg/mL and a total Ca of 3.30 mmol/l; other tests were normal. In the thyroid ultrasound, a parathyroid adenoma is observed. In consultation with the endocrinologist, the diagnosis of primary hyperparathyroidism is established. The patient undergoes surgery, the parathyroid adenoma is successfully removed, and the PTH and calcium levels normalize (PTH: 39 pg/mL and Ca tot: 2.3 mmol/l). No other risk factors were found except for a positive maternal history of osteoporosis at the age of 45. Because the patient plans further births, initiation of bisphosphonate therapy or other osteoporosis drugs has not been recommended. She is currently taking vitamin D supplements. Osteoporosis is not common in premenopausal patients.
Risk factors that may increase the risk of fractures in patients with primary hyperparathyroidism should be carefully considered. Patients with risk factors for osteoporosis should be evaluated before a fracture occurs, even at a young age.

P311

THE IMPACT OF PHYSICAL THERAPY ON OSTEOPOROSIS IN PATIENTS WITH PARKINSON'S DISEASE

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Parkinson's disease is a progressive chronic disease with an insidious onset that can lead to the loss of autonomy. Balance disorders predispose to a risk of falling, therefore maintaining an optimal bone mineral density prevents this.
Material and methods:
The purpose of the study was to evaluate the effectiveness of the application of a medical recovery program focused on physical therapy in patients with Parkinson's disease who also had osteoporosis. 20 male and female patients aged between 51 and 65 were evaluated. Bone mineral density (BMD) was determined by dualenergy X-ray absorptiometry.
10 patients received combined therapy for osteoporosis, and 10 patients were included in the physical therapy group.
Results:
The studies found that in the patients in the physiotherapy group, the bone loss was 0.8 ± 0.4% of the total body, 1.5 ± 0.3% of the femoral neck, 1.2 ± 0.1% from the proximal femur and 1.1 ± 0.2% from the lower extremities. Those with combined therapy lumbar spine BMD increased by 3.0 ± 1.1%, upper extremities - by 2.3 ± 1.2%, femoral neck and proximal femur - by 1.3 ± 0.4 % and 1.7 ± 0.3 %, respectively.
Conclusion:
The use of physical therapy in patients with Parkinson's disease brings benefits, but it would be preferable to be associated with drug therapy.

P312

THE EFFECT OF MEDICAL RECOVERY IN THE TREATMENT OF MYOGELOSIS

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Myogeloses are frequently found in patients with vicious or sedentary positions. These can lead to a decrease in the quality of life leading to depression and insomnia.
Patients show an increase in muscle tone due to biomechanical changes in the spine.
The goal is to reduce clinical functional disorders and decrease muscle hypertonia.
Material and methods:
26 female patients between the ages of 25 and 40 with painful spine pathology were evaluated. Painful nodules were identified during the objective clinical examination on palpation. Pain was assessed using the VAS scale. The patients entered a 10-day medical recovery program consisting of physical therapy focused on spine recovery for 13 patients and relaxation methods - Jacobson exercises for 26 patients.
Results:
The pain relief was completely in the patients who performed relaxation exercises in the program, and those who did not benefit from this program declared only a partial decrease in pain. In total, an improvement in muscle strength was obtained.
Conclusion:
In order to maintain the long-term therapeutic effect, it is necessary to continue physical therapy and use a correct position.

P313

ASSOCIATION OF OSTEOPOROSIS AND CARDIOVASCULAR DISEASE IN POSTMENOPAUSAL WOMEN WITH RHEUMATOID ARTHRITIS

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Background: While some research have found a link between osteoporosis (OP) and cardiovascular disease (CVD), just a handful have examined this relationship in postmenopausal women with rheumatoid arthritis (RA).
Objective The purpose of our study was to determine if postmenopausal women with OP in RA had a higher frequency of CVD and risk factors for it.
Material and method: The study included 200 postmenopausal RA women treated at the Niška Banja Institute's Rheumatology Clinic from 2018-2021. Clinical, laboratory and DEXA densitometric examination of the spine and hip was performed on all of them. Disease activity was assessed by the DAS 28 score. Risk factors for CVD (smoking, cholesterol level, diabetes, family burden), as well as the presence of CVD (hypertension, coronary disease, heart failure, sudden cardiac death) were analyzed in 49 postmenopausal patients with OP.
Results: Bone mineral density (BMD) was measured in all RA pts and in 49/200 (24.5%) osteoporosis was defined (Tscore < 2.5). 30 (61.2%) patients exhibited high RA activity, 16 (32%) had moderate activity, and only 3 (6.1%) had low disease activity.
Our findings revealed no link between CVD risk factors and osteoporosis, nor a higher frequency and association of heart failure and sudden cardiac death with OP in RA women as compared to the RA women without OP. A statistically significant association of OP with hypertensive heart disease and coronary disease was found in postmenopausal patients with rheumatoid arthritis as compared to the pts with RA, without OP ($p<0,01$ for hypertensive pts, $p<0,05$ for the pts with coronary disease). This association is more common in RA patients with high disease activity vs low or moderate disease activity.
Conclusion: To date, it has not been fully clarified whether there is

an association between osteoporosis and cardiovascular disease in rheumatoid arthritis women. Our findings unequivocally show that women with RA, particularly those with high disease activity and OP, are more likely to develop coronary heart disease and hypertension, which is why screening and early detection, as well as prevention of cardiovascular complications, are of the greatest importance in these patients.

Keywords: osteoporosis, rheumatoid arthritis, cardiovascular disease, risk factors for cardiovascular disease

P314

THE VARIABILITY OF MIR-146 AND FGF2 MICRORNA BINDING SITES DISRUPTS THEIR INTERACTION AND IS ASSOCIATED WITH A HIGH RISK OF OSTEOPOROSIS

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Objective: analysis of the frequency of distribution of alleles and genotypes rs2910164 of the *miR-146* gene and rs6854081 of the *FGF2* gene in a case-control study in individuals with osteoporosis (OP), as well as bioinformatic prediction of the effectiveness of the interaction of miR-146 and mRNA of the *FGF2* gene in silico depending on polymorphic variants of microRNA binding sites.

Material and methods

A case-control study included 601 women (62.85±6.93) and 401 men (61±14.8), which included patients with OP underwent X-ray densitometry, as well as a sex- and age-matched control group with no fractures and normal BMD levels. Genotyping was performed using KASP™ technology. We used miRBase and IntaRNA 2.0 resources to evaluate the functional significance of variants associated with the OP, in silico prediction miR-146 with mRNAs of FGF2.

Results

We found that rs2910164 (χ^2=14.9, OR=4.81, CI=1.724-2.507, p=0.0001) and rs6854081 (χ^2=9.0019, OR=2.18, CI=1.296-3.678, p=0.004) are associated with a high level of significance with the OP. It has been established that miR-146 targets the mRNA of the *FGF2* gene. The presence of risky alleles changes the efficiency of their interaction and the energy of free binding. SNPs of binding sites can affect the secondary structure of mRNA, potentially limiting the accessibility of the mRNA-microRNA interactions (fig. 1).

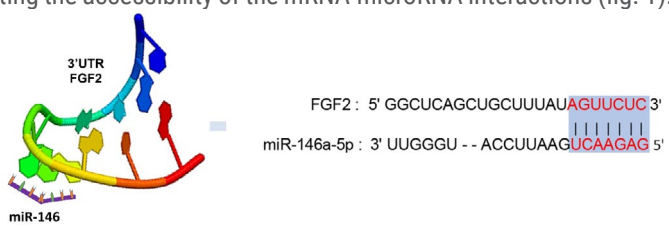

Fig. 1. miR146a5p directly targets FGF2.

Conclusion

Our results indicate previously unknown molecular mechanisms that increase the risk of osteoporosis based on microRNA epigenetic regulation. The research will continue.

Funding Statement

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P315

SYSTEMIC INFLAMMATORY MARKERS RELATED TO RISK OF FRACTURES AND HIP FRACTURE AMONG OLDER ADUTLS

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Objective: Systemic inflammatory markers, such as red cell distribution width (RDW), C-reactive protein (CRP), neutrophil-to-lymphocyte ratio (NLR), systemic immune-inflammatory index (SII), and others, have been increasingly recognized as key players in the field of inflammaging among older adults[1]. Their role in osteoimmunology (explores the interplay between the immune and skeletal systems) remains unclear but highlighting how inflammatory pathways affect bone metabolism and fracture risk[2]. Elevated inflammatory markers are associated with increased osteoclastogenesis and reduced bone formation, contributing to weakened bone structure and higher fracture susceptibility[3]. This study aims to investigate the relationship between inflammatory markers, bone mineral density (BMD), and fracture risk in older adults, while also exploring the stratified effects of these markers in fractured and non-fractured patients.

Material and Methods:

A retrospective analysis was performed on patients categorized as fractured (n=20) or non-fractured (n=20). Differences between groups in systemic inflammatory markers (RDW, PCR, NLR, SII, CALLY) were assessed using Student's t-test. Correlations between inflammatory markers, BMD parameters (HIP-BMD, LUM-BMD, WRIST-BMD) and fracture risk indices (FRAX-Total, FRAX-Hip) were analyzed using Pearson's correlation coefficient with significant differences between groups. A p-value <0.05 was considered statistically significant. Correlation matrix by www.bioinformatics.com.cn/en

Results: Fractured patients exhibited significantly higher levels of PCR (66.2±70.3 vs. 3.8±4.0, p=0.0008) and SII (1399.7±1143.4 vs. 751.4±400.8, p=0.025) compared to non-fractured patients. No significant differences were observed for RDW, NLR, or CALLY. Correlation analysis revealed a positive association between PCR and all BMD sites (HIP-BMD -0.63 p 0.002; LUM-BMD -0.6 p 0.005; WRIST-BMD -0.6 p 0.005). No significant correlation were observed for SII or FRAX values (figure 1)

Conclusion: The findings suggest that systemic inflammatory markers, particularly PCR and SII, are associated with increased hip fracture and PCR with BMD. The differences observed between fractured and non-fractured patients highlight the importance of

stratifying analyses by fracture status. These results support the potential use of inflammatory markers as complementary tools in fracture risk assessment and underscore the complex interplay between inflammation and bone health.

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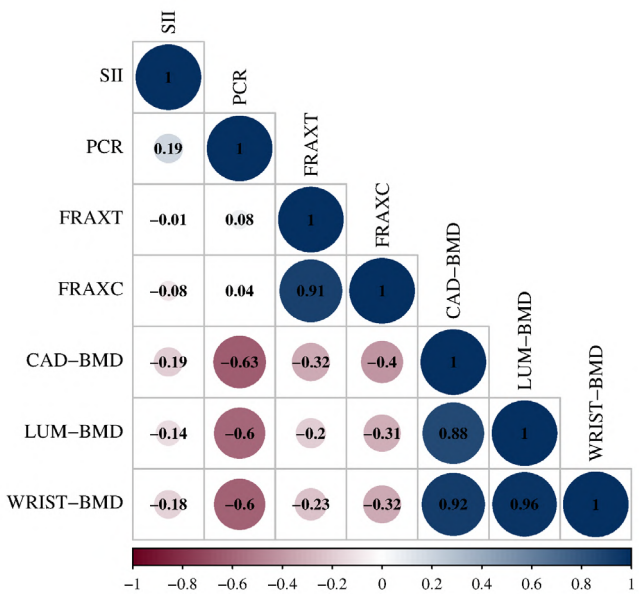
Figure 1: correlation matrix in fracture patients



P316

ROMOSOZUMAB PROFILE AMONG FRAIL OLD WOMEN: EXPERIENCE FROM A SPANISH FLS

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Introduction Frail patients, particularly those of advanced age and with multiple comorbidities, pose a unique challenge in the management of osteoporosis due to the combination of fracture risk, comorbities, and polypharmacy. Romosozumab emerges as a novel therapeutic option but with limited studies in frail very old adults. The objective of this study is to evaluate the clinical profile and outcomes of treatment with romosozumab in fragile patients.

Material and Method An observational analysis was conducted on patients treated with romosozumab in our FLS during 2023. The sample included patients with a comprehensive evaluation of clinical and laboratory parameters, including the Cumulative Illness Rating Scale-Geriatrics (CIRS-G), fracture risk using FRAX, levels of calcium, vitamin D, and parathyroid hormone (PTH). Additionally, prior treatments, cardiovascular risk factors, clinical frailty scale, functional impairment (SPPB), and prescription approval issues were recorded.

Results Fourteen patients with a mean age of 86.14 years (SD 6.02), predominantly female, and an average body mass index (BMI) of 23.11 (SD 4.15) were included. Patients had an average CIRS-G score of 11.64 (SD 3.01) and a high fracture risk (FRAX major: 26.14% (SD 11.97); hip: 14.6% (SD 9.39)). Baseline fractures were 50% hip and 50% vertebral, with an average of 2.7 fractures per patient. Laboratory levels showed mean calcium of 9.17 mg/dL (SD 0.45), vitamin D of 26.14 ng/mL (SD 6.87), and PTH of 91.92 pg/mL (SD 51.54). Previous bone mineral density (BMD) values were CAD-TS: -3.51 (SD 0.96), LUM-TS: -3.25 (SD 1.71), and WRIST-TS: -4.45 (SD 0.67). Previous treatments included teriparatide (40%) and antiresorptives (5%). Ninety-two percent had hypertension, 10% had diabetes, and 20% had renal disease (eGFR <35). The clinical frailty scale averaged 4.92 (SD 0.91), and functional impairment (SPPB) was 4.78 (SD 2.88). No fractures were reported during the intermediate follow-up, with two deaths unrelated to cardiovascular events. No adverse effects were observed post-administration, and the treatment's ease of use was highlighted.

Conclusions The profile of patients treated with romosozumab corresponds to frail individuals at very high risk with multiple comorbidities, albeit without ischemic disease. Preliminary results suggest that romosozumab is well-tolerated and may be an effective therapeutic option for this population, standing out for its ease of use and the absence of fractures during the intermediate follow-up. These findings underscore the importance of considering romosozumab for this patient profile (figure 1).

Figure 1: Recommendations to guide treatment plans for secondary prevention of osteoporotic fractures in older adults, based on degree of frailty. From SEFRAOS

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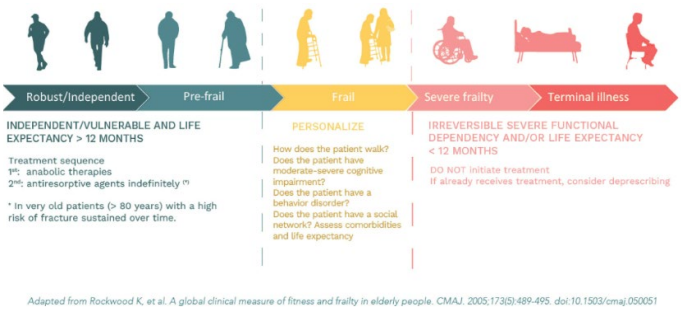

Adapted from Rockwood K, et al. A global clinical measure of fitness and frailty in elderly people. CMAJ. 2005;173(5):489-495. doi:10.1503/cmaj.050051

P317

COMPARATIVE STUDY ON THE TREATMENT EFFECT OF STRETCHING AND HIGH-FREQUENCY DIATHERMY IN SUBJECTS WITH GASTROCNEMIUS TIGHTNESS

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Objective(s)
Ankle flexibility is important for maintaining proper biomechanical function because the ankle is susceptible to injury during athletic activities. Static stretching (ST) is a widely used intervention for improving flexibility with minimal risk. Transfer Energy Capacitive and Resistive (TECAR) therapy has recently gained attention for enhancing flexibility and circulation. However, there is a lack of comparative studies evaluating the effectiveness of TECAR therapy versus ST. This study aims to compare the effects of static stretching alone and TECAR combined with static stretching (T-ST) on tightness of the gastrocnemius muscle (GCM) in healthy individuals.
Material and Methods
27 participants with bilateral GCM tightness were recruited. To administer ST, participants stood for 15 minutes on a wedge with a 0-15° incline with both feet. Concurrently, TECAR therapy in RET mode was applied to only one side GCM. The assignment of which side GCM received TECAR therapy was determined randomly. Muscle stiffness (MyotonPRO), dorsiflexion ROM (DROM), Peak torque, pennation angle (PA) of GCM measured before and after the intervention. PA was assessed using ultrasound, and it refers to the structural angle at which muscle fibers align relative to the direction of force transmission. Normality was confirmed with Shapiro–Wilk tests. Group differences and pre- and post-intervention changes within legs were analyzed with paired t-tests.
Results
There were no significant differences between the legs in any measured variables before the intervention. Both the ST and T-ST legs showed significant improvements in all measured variables after the intervention ($p < 0.05$). Especially, the T-ST leg demonstrated significantly greater increase in dorsi flexion and greater decrease in PA compared to the ST leg ($p < 0.05$).
Conclusion(s)
T-ST outperforms ST in reducing PA and increase DROM by promoting deep tissue relaxation and stimulating metabolic activity. This may leads to reduced pain and greater flexibility compared to ST. Maintaining an optimal PA ensures efficient force transmission during exercise, as evidenced by the observed increase in peak torque.

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PREVALENCE OF FALLS AMONG OLDER ADULTS IN THE MUNICIPALITY OF XOCHITEPEC, MORELOS, MEXICO

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Keywords: Falls, older adults, municipal comprehensive care program

Introduction: As the population ages, the incidence of falls has risen, becoming one of the leading contributors to the disease burden among older adults (OA).
Objective: To determine the prevalence of older adults who experienced a fall in the past 12 months.
Methodology: This was a descriptive cross-sectional study conducted among older adults in Xochitepec, Morelos, from August to December 2022. A non-probabilistic sample of 278 participants enrolled in the Municipal Comprehensive Care Program was used. Data collection was carried out using validated and standardized survey instruments focused on geriatric syndromes, following informed consent. Statistical analyses were performed using R software (version 4.4.2; R Core Team, 2025).
Results: A total of 278 older adults participated, with a mean age and standard deviation of 67.3 and 7.35 years, respectively. Three participants did not respond. The prevalence of falls was 41.1% (113/275), of whom 78.8% were women. A significant association was found between falls and sex (p-value = 0.007626 < 0.05) using Fisher's exact test. The most frequent age among participants was 62 years. However, no significant association was observed between falls and age (p-value = 0.4121 > 0.05) based on the Wilcoxon test. Similarly, Fisher's exact test revealed no significant association between falls, diabetes (p-value = 1), or involuntary urinary incontinence (p-value = 0.4202), both exceeding 0.05. Among those who experienced falls, 71.7% reported falling 1 to 3 times during the year.
Conclusion: The results of this study provide sufficient evidence to support the implementation of prevention and control strategies in the municipality of Xochitepec, Morelos.

P319

BISPHOSPHONATES IN RHEUMATOLOGY: INDICATIONS AND TOLERANCE PROFILE

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Introduction Bisphosphonates have demonstrated their effectiveness in various rheumatological conditions such as primary and secondary osteoporosis, Paget's bone disease, multiple myeloma, and hypercalcemia. Despite their proven efficacy in strengthening bones, these medications can lead to various adverse effects. The objective of our study was to examine the indications and prevalence of adverse effects of bisphosphonates in a Rheumatology department and to assess the tolerance profile of these treatments.

Patients and Methods We conducted a descriptive and retrospective study involving patients who received bisphosphonates, either orally or via injection, for various conditions in a Rheumatology department.

Results A total of 43 patients were included, with a mean age of 66.95 years [52.93]. A clear female predominance was observed (90% of cases). The indications of bisphosphonate use were osteoporosis (67.5% of cases), Paget's bone disease (22.5% of cases), multiple myeloma (15% of cases), and hypercalcemia (2.5% of cases). Among osteoporosis patients, bisphosphonate use was indicated due to fractures in 33.5% of cases. For Paget's disease, bisphosphonate indications included the presence of high-risk localizations (70% of cases), symptomatic disease with bone pain (20% of cases), or biological signs of progression (elevated alkaline phosphatase levels, 10% of cases). Regarding the bisphosphonate molecules administered, 55.8% of patients received zoledronic acid intravenously, while 44.2% received oral bisphosphonates: risedronate (18.6%), alendronate (16.3%), and pamidronate (9.3%).

Adverse effects were observed in 18.6% of patients (n=8). These included : A flu-like syndrome in 3 patients (7%),esophagitis in 2 patients (4.7%),hypocalcemia in 1 patient with multiple myeloma,acute functional renal failure in 1 patient, and jaw osteonecrosis in 1 patient.

Risedronate was implicated in the 2 cases of esophagitis. Pamidronate caused 1 case of flu-like syndrome, while zoledronic acid was responsible for all other adverse effects observed (62.5% of adverse effects). Adverse effects led to contraindications for bisphosphonate administration in 9.3% of cases (n=4) (for esophagitis, hypocalcemia, and jaw osteonecrosis). For other adverse effects, outcomes were favorable, with the flu-like syndrome resolving within hours under symptomatic treatment and normalization of creatinine levels after hydration in the case of renal failure.

Conclusion The indications for bisphosphonates in our department were diverse, with osteoporosis and Paget's bone disease being the most common. These treatments are generally well-tolerated, but adverse effects can sometimes occur. They can be severe and necessitate the interruption of these treatments.

P320

SCHEUERMANN DISEASE: A VERTEBRAL FRACTURE MIMICKER

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Introduction: Scheuermann disease is more commonly seen in adolescent males, presenting with thoracic spine kyphosis. Later in life, vertebral wedging and kyphosis can resemble osteoporotic fractures, although the radiographic findings of Scheuermann disease are distinctive.

Clinical Case: A 70-year-old male patient was referred to our Fracture Liaison Service following a recent thoracic spine computed tomography (CT) scan report, requested due to chronic low back pain, with decreased bone mineral density and wedge-shape collapse of multiple vertebrae suggesting osteoporotic fractures. As a result, the patient had started monthly ibandronate.

He had a personal history of hypertension and dyslipidemia, no family history of femoral neck fractures, no smoking habits or alcohol use and he was physically active. He had no prior fragility fractures and had no history of trauma or acute back pain. Physical examination was relevant for kyphosis, present since his adolescence, and spinous process palpation was painless.

Bone densitometry revealed a T-score of 0.8 at the femoral neck and -0.5 at the lumbar vertebra. FRAX assessment indicated a 3.3% risk of major osteoporotic fracture and 1% for hip fracture according to our population.

Given the lack of symptoms, normal bone densitometry and absence of secondary osteoporosis causes, a magnetic resonance imaging (MRI) was performed. MRI documented kyphosis (Cobb angle 46°) with anterior vertebral body wedging and irregularity of the endplates suggesting Scheuerman disease (Figure 1).

Following this diagnosis, anti-osteoporotic treatment was stopped.

Conclusion: This case underscores the importance of an accurate diagnosis and investigation of osteoporosis, to avoid exposure to unnecessary treatments. We intend to highlight the role of Scheuermann disease as a differential diagnosis of vertebral fractures.

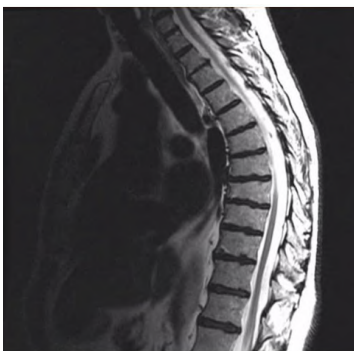

Figure 1 - Sagittal T2-weighted thoracic MRI scan: Thoracic spine kyphosis, wedging of four adjacent vertebrae (T6 to T9) and endplate irregularity (T5 to T10).

P321

OSTEOARTHRITIS HAS A STRONG ASSOCIATION WITH OSTEOPOROSIS IN OLDER CHILEANS

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Objective
The addition of the adverse consequences on health and quality of life of osteoarthritis and the high risk of falls and fractures of osteoporosis, make the association of both an important risk factor for disability. In that context, our objective was to study the association of osteoarthritis with osteoporosis in older Chileans
Methods
Cross-sectional study of 325 subjects ≥60y, mean age 64y, (30.8% men), from the ALEXANDROS cohort study, with DEXA scan, anthropometry and mobility measurements. WHO standards for Bone Mineral Density (BMD) classified them as normal, osteopenia and osteoporosis. WHO standards of BMI determine nutritional state except for undernutrition, measured with a cut point under 20 kg/m2. Short Physical Performance Battery (SPPB) was evaluated with a cut point under 10 for poor performance. Weak handgrip dynamometry was defined with cut points validated for Chileans as < 15 kg for women and < 27 kg for men.
Results
SPPB was < 10 points in 11% of both men and women. Nutritional state according to BMI categories showed 22.8% of normal BMI, undernutrition 1,5%, overweight 43.7% and obesity 32%, similar in men and women p=0.122. Weak handgrip dynamometry was observed in 16% of the sample, similar for both sexes. Osteoarthritis was reported in 42.8% of women and 19%of men (p<0.001) and Osteoporosis in 30.8% of women and 10.6% of men (p<0.001). The crude association of osteoarthritis with osteoporosis was OR=2.14; 95% CI:1.09-4.20, p<0.015. After multiple logistic regression model adjusted by age, sex, SPPB and hand grip strength, the association of osteoarthritis with osteoporosis was OR=2.6; 95%CI:1.07-4.77, p=0.032 with an area under the ROC curve for the model = 0.8052.
Conclusion.
Considering the severe consequences of osteoarthritis over health and quality of life, the high frequency of Osteoporosis with its associated risks, especially in women, and the strength of the association between both conditions, the screening of osteoporosis is highly recommended In older people with Osteoarthritis.

P322

COMPARING SILICONE-COATED SELF-ADHESIVE ABSORBENT POLYURETHANE FILMS WITH TRANSPARENT ABSORBENT FILMS FOR BILATERAL HIP DRESSING: A PROSPECTIVE RANDOMIZED CONTROLLED TRIAL

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Objective: Silicone-coated self-adhesive absorbent (SSA) and transparent films with absorbent (TFA) dressings are reportedly effective postoperative knee surgery dressings; however, there have been no direct comparative studies on these two innovative dressings over the hip areas. In this study, we aimed to compare user satisfaction and potential complications between TFA and SSA dressings for the hip area.
Material and Methods: This prospective randomized controlled trial was conducted at a tertiary hospital. The hip side to receive the polyurethane film with SSA dressing (Mepilex® Border Post-Op) was randomly allocated. The other side of the hip was covered with TFA (OPSITE Post-Op). Participants were scheduled for follow-ups 7 and 14 days after the initial application. Between-group outcomes were compared using a two-sample t-test or Wilcoxon signed-rank test for continuous variables and McNemar's chi-square test for categorical variables
Results: Thirty-two participants (30–60 years) without a history of hip surgery were included in the study. The participants were predominantly female, with a mean age of 42.8 years. Pain, difficulties in daily activities, and satisfaction scores were similar between the groups. However, moisture accumulation was significantly higher with the TFA dressing (37.9% vs. 13.8%, p<0.01), with more dressing failures (34.5% vs. 20.7%, p=0.016) and complications (37.9% vs. 17.2%, p=0.012) at the 14-day follow-up than with the SSA dressing.
Conclusions: SSA dressings are preferable for hip wound care because of better moisture management, fewer dressing changes required, and fewer complications if applied for >7 days. Both dressings offered high user satisfaction, minimal pain, and minor difficulties in daily activities.

P323

POSTOPERATIVE OUTCOMES OF COLLARED VERSUS COLLARLESS STEM IN HIP FRACTURE PATIENTS UNDERGOING HIP ARTHROPLASTY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Objective(s): This meta-analysis aims to assess and compare the postoperative outcomes, including periprosthetic fractures (PPF) and complications between collared and collarless femoral stems in hip fracture patients undergoing arthroplasty.

Material and Methods: We conducted a systematic review and meta-analysis following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The studies indexed in Medline, Scopus, and Web of Science from 2014 to 2024 were included if they reported outcomes comparing collar and collarless femoral stems. The data were extracted and analyzed using a random-effects model for periprosthetic fractures and complications, with results presented as pooled risk ratios (RR) and 95% confidence intervals (95% CI). All analyses were performed using the R program. Results: Five studies involving 29,681 patients were included. Cemented collarless stems were associated with a significantly higher risk of periprosthetic fractures (RR: 6.18, 95% CI: 2.90–13.18, $p < 0.01$) compared to cemented collar designs, with moderate heterogeneity. When both cemented and cementless stems were considered, a similar increased risk of periprosthetic fractures was observed (RR: 4.37, 95% CI: 1.68–11.34, $p < 0.01$), though the heterogeneity was high. No significant differences were found in the overall complication rates between collar and collarless femoral stem designs. Conclusion(s): While collarless femoral stems had a higher risk of periprosthetic fractures, overall complications and outcomes appear similar to those with collar designs. The observed heterogeneity suggests the need for further high-quality studies with standardized protocols to reduce variability and refine treatment strategies in hip arthroplasty.

P324

THE PRESENCE OF THE ENDOCANNABINOID SYSTEM IN AN IN VITRO MODEL OF GORHAM-STOUT DISEASE AND ITS POSSIBLE ROLE IN THE PATHOGENESIS

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Objective: Gorham-Stout Syndrome (GSD) is a rare bone disease, characterized by a massive bone resorption process, a lack of tissue regeneration and an excessive proliferation of blood and lymph vessels. The GSD etiogenesis still remains unknown and the available therapies are not resolutives. Over the last years, the Endocannabinoid System (ES) resulted to be capable of regulating several physiological mechanisms, including bone remodeling. Therefore, in this study we investigated if ES could be involved in the pathogenesis of GSD.
Materials and methods: First, we established and characterized as mesenchymal stem cell lines two primaries lines, signed as hBMMSCs and hBMMSC-GS-1, obtained from a healthy and pathological bone marrow biopsy samples from a healthy donor and a GSD patient respectively. After we have evaluated the osteoblastogenesis in both these cell lines, assessing the alkaline phosphatase (ALP) activity and hydroxyapatite deposition, through fluorimetric assay. Finally, we analyzed the presence of ES components in the two cell lines, by using TaqMan technology.
Results: Both the cell lines display the mesenchymal stem phenotype. After, we reported a reduced capacity to differentiate in osteogenic sense in hBMMSCs-GS-1 compared to hBMMSCs line. Moreover, our analyses revealed that hBMMSC-GS-1 line exhibits lower ALP activity and hydroxyapatite deposition than the hBMMSCs line. The molecular analyses showed not only the presence of the ES components in the hBMMSC-GS-1 line, but also their altered expression in these cells compared to hBMMSCs.
Conclusions: Our results showed for the first time that ES is expressed in an *in vitro* cellular model of GSD and that this molecular network may be involved in the GSD progression. Nowadays we are evaluating the possible modulation of ES components expression in hBMMSCs and hBMMSC-GS-1 cells during osteogenic differentiation, and how cannabinoids could influence this process. These data will provide a better understanding of the molecular mechanisms that may underlie the progression of GSD, paving the way to the development of innovative therapeutic strategies against GSD based on the use of phytocannabinoids contained in *Cannabis sativa*
Acknowledgments: Supported by Fondazione Ente Cassa di Risparmio di Firenze and by F.I.R.M.O. Onlus.

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IS DIFFICULT-TO-TREAT RHEUMATOID ARTHRITIS ASSOCIATED WITH A HIGHER RISK OF CARDIOVASCULAR DISEASE?

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Objective Cardiovascular risk is elevated in rheumatoid arthritis (RA). This is primarily due to chronic systemic inflammation and higher prevalence of traditional cardiovascular risk factors. The risk is even greater in patients with difficult-to-treat rheumatoid arthritis (DTRA), a more severe form of RA that is resistant to conventional treatments. This study aimed to assess cardiovascular risk factors in an RA population, and particularly in the difficult-to-treat subgroup.
Methods This bicentric cross-sectional study included 92 patients with RA diagnosed based on the 2010 ACR/EULAR criteria. Difficult-to-treat RA was defined according to the 2021 EULAR criteria. Sociodemographic, and cardiovascular risk as age, body mass index, smoking, hypertension, diabetes, cholesterol and triglyceride levels were collected, and a comparative study was performed between difficult to treat and non-difficult to treat subgroups.
Results We included 92 patients, 10 men and 82 women, with a mean age of 54 years [26–81]. Mean disease duration was 15 ±

11 years. Seventy percent had at least one cardiovascular risk factor. Mean BMI was 26.35 ± 6.18 kg/m². We noted active smoking in 15, 2%, passive smoking in 7.6%, wood smoke exposure in 15,2%, hypertension in 23,9%, dyslipidemia in 12%, and diabetes in 18.5%. Of these, 21.7% (n=20; 16 women and 4 men) were classified as having difficult-to-treat RA. We compared cardiovascular factor risks between the difficult to treat and the non-difficult to treat subgroups in table1.

	Difficult to treat RA	Non-difficult to treat RA	
Age	55±12years	54±12years	P=0,758
At least one cardiovascular risk	80%	70,59%	P=0,406
BMI	27,59±8,23 kg/m²	25,60±5,02 kg/m²	P=0,06
Active Smoking Passive Smoking Wood smoke exposure	15% 5% 10%	12,12% 8,3% 16,67%	P=0,28 P=0,492 P=0,332
Hypertension	45%	18,05%	P=0,012
Uncontrolled Diabetes	35%	13,88%	P=0,031
Dyslipidemia Mean triglycerides Level Mean total Cholesterol Level	15% 1,73±0,98mmol/l 4,92±0,99mmol/l	11,1% 1,75±2,73mmol/l 4,9±0,97mmol/l	P=0,635 P=0.976 P=0,930

Conclusion Frequency of cardio vascular risk factors among all the population was 70%. Patients with difficult-to-treat RA had a higher prevalence of hypertension and uncontrolled diabetes. Close monitoring and management of cardiovascular factors are critical to improving prognosis and quality of life for these patients.

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RHEUMATOID ARTHRITIS: DIFFICULT TO TREAT, EASY TO FRACTURE?

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Objective Bone involvement in rheumatoid arthritis (RA) is a significant comorbidity requiring regular monitoring. It worsens disease prognosis, particularly in the difficult-to-treat population, being a considerable challenge for rheumatologists.
The aim of this study was to evaluate the prevalence and the risk factors of bone involvement in a difficult-to-treat population of RA.
Methods A cross-sectional, bicentric study including RA patients fulfilling the 2010 ACR-EULAR criteria, was conducted over one year (May 2023–May 2024).
Difficult-to-treat RA was defined according to the 2021 EULAR criteria Sociodemographic, comorbidities, bone involvement, DEXA scanresults, activity score DAS28CRP, HAQ and current corticosteroid intake were collected, and a statistical analysis was performed.

Results
We included 92 patients (10 men and 82 women) with a mean age of 54 years [26–81] and a mean disease duration of 15 years±11, 51. Bone involvement was identified in 64.1% of cases: 38.98% had osteopenia and 61.01% osteoporosis. The mean T-score was -1.5 ± 1.63 at the vertebral site and -1.1 ± 1.69 at the femoral site. Pathological fractures were observed in 9.78% of this population. We compared bone involvement, risk factors for osteoporosis falls and fractures between the difficult to treat (D2T) and the non-difficult to treat subgroups in Table1.

	D2T subgroup	Non D2T subgroup	
Bone involvement **Osteoporosis** **Osteopenia** **Fractures**	75% 35% 40% 25%	61,11% 40,27% 20,83% 5,55%	p=0.252 p=0,669 p=0.08 p=0,01
Disease activity score DAS28CRP	4,44±1,70	3,36±1,39	p=0,007
Uncontrolled diabetes **Thyroid Dysfunction** **Functional Impairment (HAQ)**	35% 20% 1,62±1,77	13,88% 2,77% 0,86±0,64	p=0.031 p=0,033 p<0,01
corticosteroids	100%	77,7%	p=0.034

Table 1: Comparison between difficult to treat and non-difficult to treat RA regarding bone involvement risk factors for osteoporosis and falls

Conclusion
Bone involvement was observed in up to 75% of D2T patients. This subgroup had significantly higher prevalence of fractures. This could be explained by uncontrolled disease, higher use of corticosteroids, impaired dysfunction and poorly controlled diabetes and thyroid function.

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FIBROMYALGIA AND RHEUMATOID ARTHRITIS ASSOCIATION: A VICIOUS CYCLE

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Objective The association between fibromyalgia (FM) and rheumatoid arthritis (RA) is common, complicating disease assessment and management. FM often leads to overestimation of disease activity by both patients and physicians and increases the risk of iatrogenesis due to treatment overuse. This study purpose was to assess the impact of fibromyalgia on RA, focusing on clinical overlap, disease activity, and treatment challenges.
Methods This cross-sectional bicentric study included patients diagnosed with RA based on the 2010 ACR-EULAR criteria, conducted over one year (May 2023 – May 2024). Sociodemographic, clinical, and biological data were collected, along with therapeutic

aspects. Quality of life was assessed using the SF-36, and FM was screened using the FIRST score. Patients were divided into two groups for a comparative study: G1 (RA with FM) and G2 (RA without FM).

Results we included 80 patients (8 men and 72 women). The mean age was 55 ± 12 years, and the mean disease duration was 16±11 years. FM was noted in 38.8% (31 patients). Comparative study was resumed in table 1.

	G1	G2	
Age	55±12years	53±12years	p=0,417
Mean disease duration	18,81±11,03years	14,87±13,08 years	p=0,176
DAS28CRP	4.51±1.42	2.77±1.17	p<0.001
CRP level	12.92±16.64mg/l	8.25±9,59mg/l	p=0,117
Global assessment score	5.65±2.24	3.88±2.15	p<0.001
SF-36 physical functioning SF-36 mental health SF36-Fatigue HAQ	35.42±31.66 52.93±21.57 41.61±20.05 1.48±0.75	68.84±26.5 77.22±18.3 71.63±19.61 0.69±0.73	p<0.001 p=0.002 p<0.001 p<0.001
cumulative corticosteroid doses	47,102.39 mg	32,765.32mg	p=0,48
Fulfilling difficult to treat EULAR-2021criteria	35.54%	16.32%	p=0.049

Table 1: Comparison of the characteristics of RA patients with and without fibromyalgia

Conclusion Fibromyalgia was diagnosed in 38.8% in RA patients. It significantly affected disease assessment and management in RA patients. Overestimation of disease activity and increased risk of iatrogenic complications emphasize the need for systematic screening and individualized treatment strategies to improve patient outcomes.

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SELF-CARE BEHAVIORS AND HEALTH LITERACY CAN SERVE AS PREVENTIVE FACTORS IN OSTEOPOROSIS ASSOCIATED WITH RHEUMATOID ARTHRITIS

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Objective Osteoporosis is a frequent complication of rheumatoid arthritis (RA), and factors such as self-care and health literacy play a crucial role in influencing health outcomes.

This study aimed to explore the preventive impact of self-care behaviors and health literacy in older women with osteoporosis.

Methods This cross-sectional study including patients with RA diagnosed based on the 2010 ACR/EULAR criteria. Sociodemographic, bone involvement, DEXA scan results, Hls-eu-q16 health literacy questionnaire and menopause rating scale were collected. The **HLS-EU-16** questionnaire measures health literacy **and** the **Menopause Rating Scale (MRS)** is a tool used to assess the severity of menopause symptoms

Results Our study included 30 female patients, 15 of whom were osteoporotic and 15 with normal bone density. The average age of these patients was 59.43±8.83 years. The mean T-score at the vertebral site was -1.06±1.85, while the T-score at the femoral site was -1.48±1.58. Pathological fractures were observed in 6.7% of cases, predominantly in the osteoporotic group.From a therapeutic perspective, 66.7% of patients were on calcium supplementation, 73% on vitamin D supplementation, and 3.3% were receiving bisphosphonates. The average HLS-EU 16 score was 51.46±10.11, and the average Menopause Rating Scale (MRS) score was 13.13±8.57.

A comparative analysis between the osteoporotic group and the group with normal bone density is summarized in Table 1.

Parameter	Osteoporotic Group	Normal Bone Density Group	P-value
Age	62.87±8.70 years	56±7.78 years	p=0.031
Body Mass Index	24.97±3.59 kg/m²	27.44±4.47 kg/m²	p=0.116
Age at Menopause	44.67±6.30 years	43.13±17.19 years	p=0.748
Mean HLS-EU 16 Score	10.23±2.64	6.04±1.55	p=0.001
Mean MRS Score	8.76±2.26	4.51±1.16	p=0.001

Table1: Comparative of patient's characteristics, self-care behaviors and health literacy scores between osteoporotic and non-osteoporotic patients with RA

Conclusion:

The self-care behaviors and health literacy can play important preventive roles in older female osteoporosis with RA and it is recommended to take into account health literacy as one of the most important tools to improve self-care in patients with RA.

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SOS: THE SEA HOSPITAL SHEET TOOL FOR IDENTIFICATION AND TREATMENT OF PATIENTS WITH FRAGILITY FRACTURES

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Objectives As shown in the IOF-SCOPE study (2021), in Italy, out of a total of 2,889,000 women with osteoporosis, only 834,000 receve treatment, with a treatment gap of 71%.
In the Fracture Liaison Service (FLS) team the orthopedic surgeon has a crucial role, after surgery, in the implementation of therapeutic protocols, following updated guidelines, aimed to prevent the risk of a new fracture. To facilitate this action we propose a dedicated tool, developed at our institution, called the **SOS** (**S**ea h**O**spital **S**heet). Therefore, the major objective of our study is to provide an easy and effective tool for the orthopaedic surgeons to better identify and treat patients with fragility fractures.
Methods The SOS includes several domains: personal data, identification of the fracture site, family and personal history of fractures, comorbidities and previous osteoporosis treatments, detection of pain and pre-operative functional skills, DXA T-score values, ASA risk, time to and duration of the surgery, surgical technique and need for blood transfusion, a domain on discharge and post-operative functional capacity, proper anti-refracture drug treatment, and a battery of tests for the follow-up.
Results This retrospective analysis includes a cohort of 1263 patients (880 women, 383 men) with proximal femur fractures, admitted between January 2014 and December 2016, when an operative FLS was not available, and a cohort of 1110 patients (765 women, 335 men) admitted between January 2017 and December 2019, identified using SOS. Here to follow the data: before the use of SOS, at discharge, only 13% received drug therapy, after the use of SOS 83% received appropriate drug therapy (TPTD 36%, DNB 33%, BP 31%).
The clinical data, in the latter cohort were as follows: mean time to surgery was 16.5 h (min. 6 h – max 36 h); 28.5% of patients required blood transfusions; 64% of the patients presented lateral fractures, and hemiarthroplasty was performed in the 66% of patients with medial femoral fractures; at the admission, only 17.5% of patients were on therapy for osteoporosis (mean duration 16 months).
Conclusions In our clinical experience, the use of a dedicated and quick-to-fill identification tool, such as the SOS, can be a valuable support for the orthopaedic surgeon to better manage patients with fragility fractures. The use of SOS allowed a significant improvement of the occurence of a new fragility fracture through a proper drug therapy and follow up.

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ASSESSMENT OF BONE MINERAL DENSITY USING RADIOFREQUENCY ECHOGRAPHIC MULTI SPECTROMETRY (REMS) TECHNOLOGY IN SUBJECTS WITH BONE MARROW EDEMA

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Objective
Bone Marrow Edema (BME) syndromes are diseases of unknown etiology characterized by the presence of bone marrow edema on magnetic resonance imaging (MRI). It is known that patients with BME exhibit reduced bone mineral density (BMD) values compared to healthy controls. The aim of our study was to evaluate whether the use of Radiofrequency Echographic Multi Spectrometry (REMS) allows for BMD assessment comparable to DXA in subjects affected by BME.
Material and Methods
In a cohort of 69 subjects (57.44 ± 12.99 years) with BME and in 50 healthy patients, we measured lumbar (BMD-LS) and femoral (femoral neck: BMD-FN, total femur: BMD-FT) BMD using the DXA method; furthermore, an evaluation of the same anatomical sites was performed using the REMS technique. Among the patients with BME, 23 patients had a presentation compatible with Complex Regional Pain Syndrome type 1 (CRPS-1), 20 patients had BME at the hip level, and 26 patients at the knee level.
Results
BMD values were reduced in subjects with BME compared to controls at all skeletal sites examined with both DXA and REMS methods. All three subgroups of BME patients showed a higher prevalence of osteoporosis compared to controls, and this prevalence was more evident in patients with CRPS-1 and hip BME compared to those with knee BME. Also in this case, the REMS method, like DXA, was able to discriminate T-score values in the three BME subgroups.
Conclusion
Our data confirm the validity of the REMS method in assessing bone mineral density in patients with BME; therefore, the REMS method can be proposed as a valid alternative to DXA measurement in a category of patients where the underlying condition of bone fragility is commonly not evaluated.

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USE OF RADIOFREQUENCY ECHOGRAPHIC MULTI SPECTROMETRY (REMS) FOR MONITORING BONE MINERAL DENSITY IN A YOUNG WOMAN AFFECTED BY VITAMIN D-DEPENDENT RICKETS DURING PREGNANCY AND LACTATION

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Vitamin D-Dependent Rickets Type I (VDDR-I) is an early-onset, inherited disorder of vitamin D metabolism, characterized by severe hypocalcemia leading to osteomalacia and rachitic skeletal deformities, and moderate hypophosphatemia. In patients with conditions affecting the skeleton, it is important to have a method for monitoring bone status during pregnancy, but especially during lactation. For some years, a new ultrasound approach, defined as Radiofrequency Echographic Multi Spectrometry (REMS), has been available. This method does not use ionizing radiation and can be applied to women during pregnancy and lactation.
Case Report: C-P, a 27-year-old woman with VDDR-I carrying a CYP27B mutation, has been followed for many years at the Skeletal Bone Diseases Clinic of the University of Siena, Italy. Periodic blood tests show calcium and phosphorus levels at the lower limits of normal with a slight increase in PTH. The patient is treated with calcitriol combined with cholecalciferol and calcium carbonate but has poor treatment adherence. Over the years, the patient has reported fractures at the distal levels of the lower and upper limbs (left tibia and fibula, right elbow, and left elbow). In March 2023, she announced her pregnancy; therefore, it was decided to monitor her bone status by performing serial densitometric measurements using the REMS method throughout pregnancy, during lactation, and one year postpartum. Figure 1 shows the longitudinal assessment of bone mineral density (BMD) at the femoral neck in the first and third trimesters and a further check-up after delivery. The ability to assess bone status using the REMS method in young women is revolutionary, as it offers a safe option for evaluating bone health d

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ANALYSIS OF BONE TURNOVER MARKERS IN PATIENTS TREATED WITH ROMOSOZUMAB IN ROUTINE CLINICAL PRACTICE

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Introduction: Romosozumab (Rmab) is an anti-sclerostin medication indicated for patients at high risk of fracture. This study aims to describe the prior therapeutic sequences (and their effects on bone turnover markers [BTMs]) in patients treated with Rmab in real-world clinical settings, as well as their densitometric response, adverse events, and post-Rmab treatment sequences.
Materials and Methods: Descriptive observational study including patients treated with Rmab for at least 3 months. Clinical data, laboratory analyses, BTMs, spine X-rays, and bone densitometry were collected.
Results: Seventeen postmenopausal women, mean age 70.5±8 years, were included. Of these, 8 completed 12 months (12M) of treatment and 6 completed 6 months (6M). All patients had a history of fragility fractures (median of 2 fractures per patient): 11 vertebral, 6 distal radius, 4 proximal humerus, 3 pelvis, and 2 femur fractures. Regarding prior treatment, 8 patients had received bisphosphonates (BF) (4 zoledronate, 4 alendronate), 4 teriparatide, 3 denosumab (Dmab), and 2 raloxifene.
Overall, bone mineral density (BMD) increased: lumbar spine +7.1% and +8.9% at 6M and 12M, respectively; femoral neck +2.2% at both 6M and 12M; and total hip +2.9% and +4.4% at 6M and 12M. Patients previously treated with BF showed greater BMD gains compared to those treated with teriparatide or Dmab, although the differences did not reach statistical significance.
The evolution of BTMs varied depending on the prior treatment. Patients previously on BF showed a rise in PINP (+46%) and a decline in CTX by 1 month. Those transitioning from Dmab had marked increases in both markers at 3 months (+1204% and +273%, respectively). In contrast, patients transitioning from teriparatide exhibited a decline in BTMs.
During Rmab treatment, 3 patients experienced skin reactions, 1 had an injection site reaction, and 2 developed rhinosinusitis (one case led to Rmab discontinuation). One patient sustained a femoral fracture at 3 months. No new vertebral fractures were reported.
After completing 12 months of Rmab, 7 patients initiated Dmab and 1 began intravenous BF therapy.
Conclusions: In real-world clinical practice, the prior therapeutic sequence influences both BTM and BMD responses to Rmab. Patients previously treated with BF achieved superior BMD increases compared to those transitioning from teriparatide or Dmab. The BTM behavior suggests a potential "rebound" effect in patients transitioning from Dmab to Rmab. After completing 12 months of Rmab, all patients started antiresorptive therapy. Notably, 35% of patients experienced adverse events, although only one required Rmab discontinuation.

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COMBINED DENOSUMAB AND CORE DECOMPRESSION IN PATIENTS WITH OSTEONECROSIS: A PILOT STUDY

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Osteonecrosis of the femoral head (ONFH) is a debilitating condition that often leads to femoral head collapse and ultimately requires total hip arthroplasty (THA) in advanced stages. While core decompression is a widely used joint-preserving surgery, its outcomes remain inconsistent. Denosumab, a potent antiresorptive agent, has shown promise in reducing bone resorption and potentially delaying femoral head collapse, though its efficacy in ONFH remains uncertain. This study explores the potential synergy of combining denosumab with core decompression to improve femoral head survival and reduce the need for THA in patients with extensive necrosis. Over five years, 53 patients (67 hips) with Steinberg stage IIC or IIIC ONFH were retrospectively analyzed. The denosumab group (n=32) received two postoperative 60 mg doses, while the control group (n=35) underwent core decompression alone. The denosumab group achieved a higher THA-free sur-

vival rate (87.5% vs. 64.71%), though the difference was not statistically significant (p=0.0821). Radiographic progression rates were comparable between groups (56.25% vs. 58.82%; p=0.85). Notably, subgroup analysis revealed a potential benefit for patients with Steinberg stage IIC. These findings suggest that combining denosumab with core decompression could be a promising strategy to delay THA in ONFH, especially in early-stage patients with large necrotic areas. Further studies are warranted to validate these results and refine treatment protocols.

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ASSESSMENT OF BONE HEALTH PARAMETERS AND FRAGILITY FRACTURE PREVALENCE IN A POPULATION OF MEN OVER 50 IN ARGENTINA

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Objective To describe the characteristics of the studied population and analyze clinical and bone health parameters associated with fragility fractures.

Materials and Methods This retrospective study reviewed 504 electronic records of Caucasian men >50 years referred for bone health evaluation between January 2022 and December 2024. Bone assessments included DXA (Lunar iDXA, GE Healthcare) with Trabecular Bone Score (TBS), Lumbar Vertebral Assessment (LVA), and FRAX®. Data included age, BMI, risk factors, and fracture history. Variables were described as proportions or mean ± standard deviation. Associations with fractures were analyzed using chi-square or t-tests ($p < 0.05$). Institutional review board approval was obtained.

Results The mean age was 67.7 ± 9.2 years, and mean BMI was 29.2 ± 4.4 kg/m², with 83.9% overweight/obese. Osteoporosis (BMD-based) was found in 11.2%. TBS (n=358) averaged 1376.7 ± 117.4, with pathological values (<1300) in 26.3%. Vertebral fractures were detected in 25 patients via LVA. FRAX® (n=262) estimated a mean 10-year fracture risk of 5.1% for major osteoporotic fractures (MOF) and 2.1% for hip fractures (HF) in patients without prior fractures. These risks were significantly higher in patients with prior fractures, reaching 9.4% for MOF and 5.1% for HF ($p < 0.001$ for both comparisons).

A total of 69 fractures occurred in 62 patients: 36 vertebral (11 clinical, 25 morphometric), 15 hip, 7 radius, 6 tibia-fibula, 4 shoulder, and 1 pelvic. Fractures were more frequent in patients with low femoral neck BMD ($p<0.001$). TBS was significantly lower in patients with fractures ($p=0.005$), particularly clinical vertebral fractures ($p<0.001$). Morphometric fractures showed no differences in TBS or BMD compared to non-fractured individuals. The most significant risk factor was prior fracture (12.3%). Diabetes prevalence was 15.7%.

Among overweight/obese and diabetic men, pathological TBS or higher fracture prevalence was not observed. However, other risk factors were associated with lower TBS ($p<0.001$) and increased fracture risk ($p<0.001$).

Conclusions This study highlights the combined utility of BMD, TBS, and FRAX in fracture risk assessment. Comprehensive evaluations using these markers and risk factors are essential to guide prevention and treatment strategies for fracture risk.

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SHORT SLEEP DURATION IS ASSOCIATED WITH A HIGHER RATIO OF OSTEOPOROSIS IN OLDER ADULTS: A LONG-TERM CARE FACILITY-BASED STUDY IN TAIWAN

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Objectives: This study primarily aims to analyze the relationship between osteoporosis and sleep quality. Sleep quality is assessed using the the snoring, tiredness, observed apnea, high BP, BMI, age, neck circumference, and sex questionnaire(STOP-Bang) and Pittsburgh Sleep Quality Index (PSQI) questionnaires, with a particular focus on individuals over the age of 65.

Methods: In this cross-sectional study, osteoporosis screening was conducted among older adults in long-term care facilities operated by Kaohsiung Veterans General Hospital in Taiwan in 2019. osteoporosis was diagnosed using dual-energy X-ray absorptiometry. STOP-Bang and PSQI questionnaires explored the relationship between sleep quality and bone mineral density. Initially, data from 357 participants were collected, with missing data and participants under 65 years of age excluded, resulting in 326 participants for the final analysis.

Results: This study involved 326 participants with a mean age > 80 years. Sleep duration < 4 h was significantly associated with osteoporosis (odds ratio: 2.30, 95% confidence interval: 1.15–4.57) regardless of sex. Additionally, HRV was not significantly associated with sleep quality or osteoporosis.

Conclusions: Among older adults aged >80 years, sleep duration < 4 h revealed a notably higher ratio of osteoporosis. Sex may not significantly contribute to osteoporosis in older adults, and HRV may not be an optimal indicator of sleep quality in this demographic.

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GAPS IN OP GUIDELINE-ADHERENT TREATMENT: A CLAIMS DATA ANALYSIS ON WOMEN AGED 55+ IN GERMANY

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Objectives According to German osteoporosis guidelines, women with femoral or vertebral fractures face a very high risk of subsequent fractures and are advised to receive specific treatment[1,2]. We evaluated treatment initiation rates, subsequent fracture risks, and nursing home discharge in women aged 55+.

Material and Methods This retrospective analysis of a German claims database (4.1 million insured) included statutorily health insured (SHI) women aged 55+ years with proximal femoral or vertebral fractures in 2017–2021, before 2023 guideline update[2]. For 2021 cases, we assessed treatment status and nursing home referrals within one year. Subsequent fracture risk within one year was analyzed for all years.

Results In 2021, extrapolated to SHI, 145,188 women with new vertebral (0.96%; mean age 71.8 [SD 10.5] years) and 58,851 with femoral (0.39%; 76.4 [SD 10.9] years) fracture were identified.

Of those patients with vertebral fracture and known osteoporosis (OP), 24.7% were treated before index fracture, 15.8% initiated treatment and 59.5% remained untreated within 6 months after index; those numbers were 1.5%, 14.0% and 84.6% for unknown OP, respectively. Following femoral index fracture with known OP, 17.1% were already treated, 4.7% started treatment and 78.1% remained untreated; for unknown OP respective numbers were 0.7%, 4.6% and 94.7%. The mean time to treatment initiation was 75.1 (SD 46.1) days after femoral and 62.0 (SD 46.9) days after vertebral fracture. Of untreated patients, at least 16.7% (femoral) and 6.4% (vertebral) were discharged from hospital to nursing home within one year.

In untreated femoral fracture patients (n=282,026; period 2017–2021), 28.1% had another femoral fracture and 5.0% a vertebral fracture within one year. Untreated patients with vertebral fracture (n=630,102) had a risk of 27.8% for a second vertebral and 2.0% for a femoral fracture within one year after index.

Conclusion Although guidelines included an option to initiate OP therapy without a prior BMD measurement in patients with a femur or higher-grade vertebral fracture the majority remain untreated. This suboptimal care of osteoporosis patients in Germany substantially increased rates of secondary fractures. Urgent adherence to osteoporosis treatment guidelines is needed for high-risk patients. DVO 2023 guideline update included a 3-year fracture risk threshold to ensure that patients receive an adequate treatment[2].

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1. Guidelines DVO 2019
2. Guidelines DVO 2023

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Disclosure

SM & JP were/are employees of GFL and received funding from UCB. HDP, CH, RB, and LM are employees, and LM is shareholder of UCB.

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THE ROLE OF NON-MASS BONE PROPERTIES IN FRACTURES OF OSTEOPENIC PATIENTS

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Osteopenia (T-score from -1.0 to -2.5) is common in people older than 65 ys, and more than half of fractures occur in osteopenia. It is not clear whether this fragility is caused simply by the decreased bone mass or non-mass bone properties also contribute? Our aim was to examine some non-mass bone properties in osteopenic patients with or without previous fracture, using trabecular bone score (TBS) and quantitative ultrasonosography (QUS). In a 2 years period 4,758 patients were sent to our Densitometry Lab with suspected osteoporosis (1,544 (32%) with previous fractures). We analyzed data of 4170 women (fracture in 1387 = 33%). BMD measurements were done at the lumbar spine, hip and forearm. QUS was performed on 397 patients (83 fractures), and TBS on 689 patients (149 fractures). Patients were grouped as normals (T-score >-1 on all bones), osteopenics (T<-1 on at least one bone, but not below -2.5 on any bone) and osteoporotics (T-score <-2.5 on at least one bone).

BMD was measured by DEXA (Lunar Prodigy, WI, US) and TBS was calculated from spine densitometry. QUS was performed on the heel bone (Lunar Achilles Plus, WI, US). Fracture probability was calculated by FRAX. In case of previous fracture the FRAX was also calculated without taking the fracture into account.

We found 480 normals (49 fracture), 2506 (818) osteopenics and 1299 (520) osteoporotics (OP). The fractured patients were 4-9 years older in the groups ($p<0.001$), and their height was 1-3 cm less ($p<0.01$). In normals, the BMD and T-score in the fractured and non-fractured subjects were the same, while fractured subjects showed lower BMD and T-score on all bones ($p<0.002$) in osteopenia and OP groups. QUS and TBS showed the same pattern: no difference in normals, and lower values ($p<0.02$) in osteopenia and OP in fractured than in non-fractured patients. Excluding the younger ones from the non-fracture osteopenic patients, we formed an osteopenic non-fracture group with equal age to osteopenic fractured patients (69.1 and 69.2 years, $p>0.61$): comparing these two groups, the axial (spine and hip) BMD differences remained, but the differences in QUS and TBS values disappeared between fractured and non-fractured patients. In the meantime, however, the FRAX differences between the fractured and non-fractured patients remained even if the previous fractures were not taken into account in FRAX recalculation.

Our data did not prove the role of non-mass characteristics in the

fragility of osteopenia. However, the age-adjusted FRAX calculated without fracture indicates that in osteopenia, in addition to the decreasing BMD, other factors may be involved in the occurrence of bone fracture.

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EFFECTS OF AMORPHOUS CALCIUM CARBONATE (ACC) SUPPLEMENTATION ON BONE HEALTH IN POSTMENOPAUSAL WOMEN WITH OSTEOPENIA: A RANDOMIZED CONTROLLED TRIAL

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Osteopenia, characterized by reduced bone mineral density (BMD), poses a significant risk for osteoporosis and fractures, particularly in postmenopausal women. This randomized, double-blind clinical trial aimed to investigate the effects of amorphous calcium carbonate (ACC) supplementation on BMD and bone turnover markers (BTMs) in postmenopausal women with osteopenia. Forty-four participants were initially recruited, with 35 completing the 6-month intervention. The ACC group (n = 18) received 400 mg/day of ACC, while the control group (n = 17) received a placebo. Dual-energy X-ray absorptiometry (DXA) was used to assess BMD, and BTMs including bone-specific alkaline phosphatase (BAP), C-terminal telopeptide of type I collagen (CTX), and procollagen type 1 N-terminal propeptide (P1NP) were measured. Results showed significant improvements in BMD, particularly at critical skeletal sites, and favorable changes in BTMs with ACC supplementation, suggesting a potential role in osteopenia management.

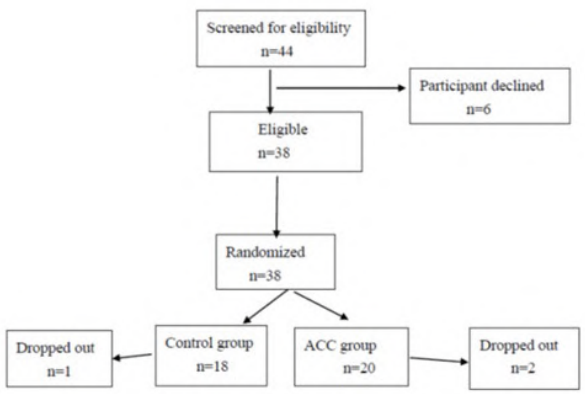

Figure 1. Participant enrollment.

Table 1. Baseline characteristics of women participating in the study[1].

	Control (n = 17)	ACC (n = 18)	P value
Age (y)	55.08 ± 4.44	57.38 ± 3.43	0.164
Height (cm)	157.83 ± 8.89	156.15 ± 4.16	0.559
Weight (kg)	56.63 ± 7.23	56.86 ± 11.38	0.952
BMI (kg/m2)	22.73 ± 2.13	23.30 ± 4.38	0.678
Body fat (%)	28.58 ± 4.49	31.18 ± 6.31	0.247
E2 (pg/mL)	8.15 ± 4.37	7.96 ± 3.33	0.887
FSH (mIU/mL)	62.25 ± 22.53	72.11 ± 21.95	0.200
GOT (mg/dL)	24.35 ± 18.23	24.00 ± 9.09	0.943
GPT (mg/dL)	15.94 ± 6.53	26.00 ± 20.55	0.062
GlucoseAC (mg/dL)	97.06 ± 8.36	100.00 ± 12.32	0.413

[1] All values are the mean ± SD.
Abbreviations: BMI, body mass index; E2, estradiol; FSH, follicle-stimulating hormone.

Table 2. DXA analysis.

	Experimental (ACC)			Placebo (Control)			Differences between groups at 0 and 6 months
	0 Months mean ± SD	6 Months mean ± SD	P value*	0 Months mean ± SD	6 Months mean ± SD	P value*	P value**
Lumbar spine L2	-0.45 ± 0.90	-0.32 ± 0.94	0.26	-0.94 ± 0.72	-1.04 ± 0.80	0.33	0.13
Lumbar spine L3	0.31 ± 0.91	0.33 ± 1.01	0.81	-0.41 ± 0.84	-0.58 ± 0.70	0.12	0.17
Lumbar spine L4	0.45 ± 1.42	0.55 ± 1.37	0.13	-0.27 ± 0.61	-0.20 ± 0.70	0.36	0.80
Lumbar spine L2-4	0.10 ± 1.05	0.16 ± 0.90	0.52	-0.50 ± 0.67	-0.65 ± 0.67	0.14	0.13
Left femur	-0.75 ± 0.85	-0.96 ± 0.69*	0.006	-0.88 ± 0.90	-0.98 ± 0.75	0.19	0.24
Neck	-0.82 ± 0.78	-0.96 ± 0.69*	0.017	-0.88 ± 0.90	-0.98 ± 0.75	0.19	0.67
Ward's triangle	-1.90 ± 0.76	-1.87 ± 0.73	0.62	-1.65 ± 0.78	-1.70 ± 0.73	0.52	0.41
Greater trochanter	-0.51 ± 0.66	-0.45 ± 0.77**	0.59	-0.73 ± 0.54	-1.04 ± 0.75*	0.005	0.012
Total Hip	-0.55 ± 0.80	-0.54 ± 0.84**	0.74	-0.63 ± 0.67	-0.77 ± 0.67*	0.041	0.053

BMD values reported are in T-scores, all values are the mean ± SD.
*Differences between interventions were assessed by using paired t tests.
**Differences between groups were assessed by using a two-sample t test.

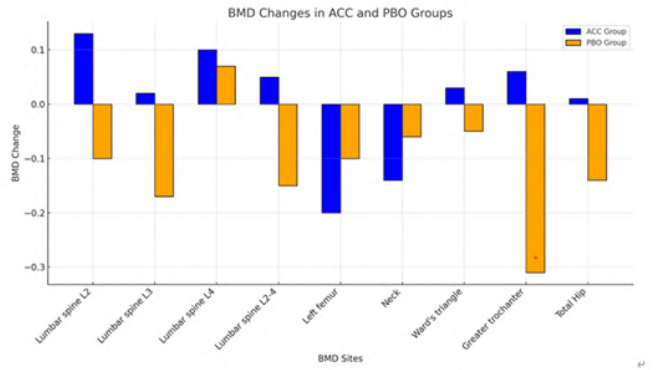

Figure 2. shows the changes in bone mineral density (BMD) for ACC group and control group (PBO) at various sites, compared in an overlapping manner. Sites with a p-value less than 0.05 are marked with a red asterisk (*) to indicate significant differences.

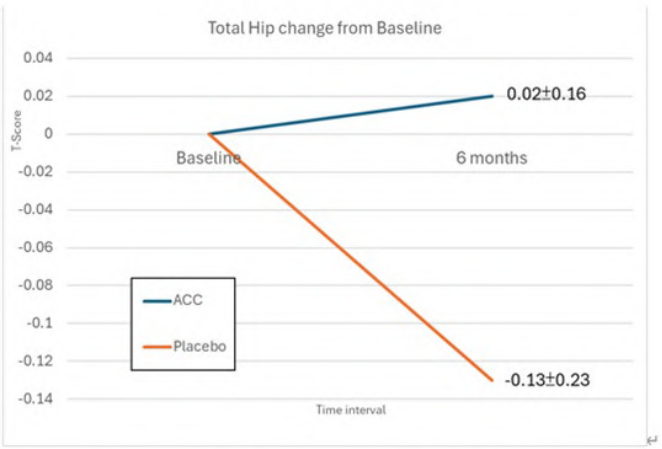

Figure 3. shows the change in total Hip after 6 months of intervention.

Table 3. Bone turnover markers.

Serum	Experimental (ACC)			Placebo (Control)			Differences between groups at 0 and 6 months
	0 Months mean ± SD	6 Months mean ± SD	P value*	0 Months mean ± SD	6 Months mean ± SD	P value*	P value**
BAP	11.86 ± 3.67	10.83 ± 2.84	0.022	13.00 ± 4.83	13.77 ± 3.91	0.33	0.049
CTX	0.27 ± 0.16	0.22 ± 0.10	0.18	0.26 ± 0.17	0.18 ± 0.12	0.18	0.66
P1NP	55.21 ± 17.65	43.50 ± 14.37	0.001	55.90 ± 18.85	55.32 ± 15.38	0.78	0.004

All values are the mean ± SD.
*Differences between interventions were assessed by using paired t tests.
**Differences between groups were assessed by using a two-sample t test.

Figure 4. shows the changing trends of BAP, P1NP and CTX as well as the changes in total BMD after ACC and Placebo intervention.

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IMPACT OF DENOSUMAB DISCONTINUATION ON BONE HEALTH IN WOMEN WITH EARLY-STAGE BREAST CANCER: INSIGHTS FROM THE SWISS PROLIA STUDY

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Objective(s): To evaluate the effects of denosumab (Dmab) discontinuation (DD) on vertebral fracture (VF) risk in postmenopausal women with early-stage breast cancer (ESBC) undergoing adjuvant aromatase inhibitor therapy, and to identify associated risk and protective factors.

Material and Methods: Data derived from the Swiss Prolia Study cohort[1] included 797 postmenopausal women (134 ESBC) treated with Dmab. All received ≥ 2 injections and were followed for ≥30 months post-discontinuation. Key outcomes included VF prevalence, multiple VF (MVF) and total VF count. Bone turnover markers (BTM), bone mineral density (BMD) and fracture occurrence were analyzed across three periods: before, during and after discontinuation. Statistical analyses utilized Cox proportional hazard models and logistic regression.

Results: At baseline, ESBC patients were younger (mean age 62 vs 66 yo, p<0.001), had higher baseline BMD (at all sites p<0.001), less VF and non-VF, and were less pretreated with bisphosphonates (BP) (22% vs 53%, p<0.001) than women without breast cancer (WBC). ESBC patients received more Dmab doses (6.7 vs 5.7, P=0.002). After DD, 62.7% of ESBC patients received BP (vs 67.1% in WBC); BMD decreased significantly at all sites, more pronounced in ESBC. 17 ESBC patients (12.7%) had 46 VFs of whom 13 (10%) had MVF (3.2VF/patient). In WBC, 65 (9.8%) had 169 VF, 47 (7.1%) had MVF. Prior VFs and elevated BTMs after DD were strongly associated with the risk of VF after DD. No protective factor was identified. Non-VF were rare, with no cases after DD in ESBC.

Conclusion(s): DD in ESBC patients is associated with a high risk of VF, particularly MVF, despite higher BMD and younger age. Our findings highlight the importance of cautious decision-making regarding Dmab initiation, particularly in younger women or with higher BMD. Incorporating BP into the therapeutic regimen before or during the rebound period may reduce fracture risk[1-2], especially in those at low fracture risk.

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Disclosures (if applicable):

No conflicts of interest were disclosed.

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SURVIVAL, DISABILITY, PAIN AND HEALTH-RELATED QUALITY OF LIFE FOLLOWING HIP FRACTURE IN ZIMBABWE: A PROSPECTIVE COHORT STUDY

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Objective

In Africa fragility fracture risk is increasing as longevity increases. We assessed health outcomes in the year after hip fracture in older adults in Zimbabwe.

Methods

A cohort of adults ≥40 years with hip fracture, presenting to hospitals in Harare (2 public; 5 private) (2021-22) were followed-up for one-year. Operative management, survival, health-related quality

of life (HRQoL) utilities from EQ-5D-5L, disability (WHODAS), and pain were measured. Associations between patient characteristics and odds of operative management were assessed.

Results

Of 196 hip fracture patients (49% female and median age 74·0 years [IQR 63·0-83·0]), 86·2% were fragility fractures, 173 (88·3%) were managed in public hospitals, where just 96 (55·5%) received operative hip fixation; all 23 (11·7%) managed in private facilities received an operation. After 365-days, 55 (29·4%) had died (41·9% of those age ≥70 years, and 8·6% of those <70 years). In public hospitals, 42.5% of non-operated patients died, vs. 19·4% of those operated.

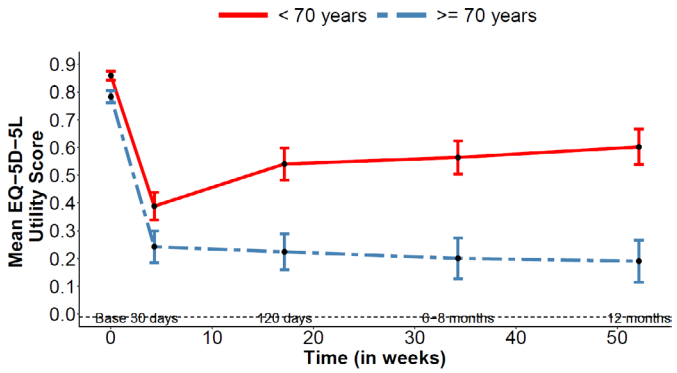
By 30-days the mean HRQoL utility score had fallen by 64·1% from 0·81[95%CI 0·79,0·82] pre-fracture to 0·29[95%CI 0·25,0·33]. After 120-days, minimal recovery was seen, especially in those age ≥70 years (Fig-1). Post-fracture disability was near universal, with only 2% disability-free by 365-days, when 97% still reported hip injury-related pain, with 94% having pain interfering with walking, and 80% with sleep. Higher household income was associated with higher odds (OR=3.02[95%CI 1.55,6.16]), and malnutrition with lower odds (OR=0·31[95%CI 0·14,0·65]), of being operated.

Conclusions

Substantial health inequities in hip fracture care provision have been identified by these unique data. Following hip fracture in Zimbabwe, quality-of-life and survival fall substantially, more so than seen after stroke in other regions, demanding implementation of guidelines to standardise care and improve operative capacity to manage the predicted rise in fractures.

Fig-1

HRQoL prior to hip fracture and over 12-months



P345

WHOLE-ORGAN MAGNETIC RESONANCE IMAGING SCORE (WORMS) DOES NOT CORRELATE WITH CLINICAL IMPROVEMENT FOLLOWING PRP INJECTIONS IN KNEE OSTEOARTHRITIS

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Objective

This observational prospective cohort study investigates the effectiveness of three doses of platelet-rich plasma (PRP) injections in patients with knee osteoarthritis (OA). The semi-quantitative whole-organ scoring system (WORMS) was employed to assess structural changes in the knee post-PRP injection over a 6-month period.

Materials and Methods

Twenty patients diagnosed with knee OA received PRP injections as an alternative treatment. They were evaluated pre- and post-injection using the WORMS scoring system to assess structural changes. Clinical outcomes were measured through:

- Visual Analog Scale (VAS) for pain
- Patient-reported outcome measures (PROMs), specifically the Western Ontario and McMaster Universities Osteoarthritis (WOMAC) Index
- Performance-based measures (PBMs), including:
  - Timed Up and Go Test (TUGT)
  - 5-Time Sit to Stand Test (5 × SST)
  - 3-Minute Walk Test (3-min WT)

Results

- The overall WORMS score increased from 38.15 ± 17.48 (pre-treatment) to 40.30 ± 18.87 (post-treatment), indicating a mean change of 2.15 (95% CI: 0.82, 3.48).
- Notably, the WORMS score for articular cartilage demonstrated the most substantial increase, with a mean change of 1.45 (95% CI: 0.5, 2.4).
- Significant improvements in VAS were recorded at 3 weeks post-treatment, achieving both clinical and statistical significance by 6 weeks and sustained at the 6-month follow-up.
- Delayed improvements in PBMs were also observed at the 6-month mark.

Conclusion

Despite clinical improvements following three PRP injections for knee OA, there was no correlation with the changes in the whole-organ magnetic resonance imaging score (WORMS) after 6 months. While WORMS scores indicated potential structural deterioration or minimal change, notable improvements in VAS, PROMs, and PBMs were documented. A novel technique is proposed to elucidate these contrasting findings.

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IMAGE-BASED ROBOTIC TOTAL HIP ARTHROPLASTY RESTORES THE HIP JOINT ANATOMY AND LEADS TO FAVORABLE OUTCOMES AT A MINIMUM OF 2 YEARS FOLLOW-UP

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Objectives:
Total hip arthroplasty (THA) is a commonly performed procedure aimed at alleviating pain and restoring joint function in patients with hip arthritis [1, 2]. Accurate restoration of hip joint anatomy is critical for achieving optimal outcomes and longevity of the implant. Recent advancements in image-based robotic systems have enabled precise preoperative planning and execution of the procedure [3, 4]. This study evaluates the clinical and radiographic outcomes of image-based robotic THA in restoring hip joint anatomy and achieving favorable functional outcomes with a minimum follow-up of 2 years.

Material and Methods:
This retrospective analysis included 80 consecutive patients (58 females, 72.5%) who underwent image-based robotic THA between 2019 and 2021. The mean age of the cohort was 77.5 years (SD=6.2), and the mean follow-up duration was 3.6 years (SD=0.3). Preoperative and postoperative Harris Hip Scores (HHS) were recorded to assess functional outcomes. Accuracy in component placement was evaluated by comparing the planned and actual inclination and anteversion angles of the acetabular cup. Statistical analysis was performed to assess the significance of clinical improvements and radiographic accuracy.

Results:
The mean preoperative HHS was 49.8 (SD=7.8), which significantly improved postoperatively to 92.4 (SD=4.6), reflecting a mean increase of 85.6%. The mean difference between planned and final cup inclination was 1.8° (SD=0.4), and the mean difference in anteversion was 1.3° (SD=0.2), indicating high accuracy in component placement. Only one case (1.3%) of traumatic dislocation was recorded, requiring open reduction. No other complications were noted in this cohort.

Conclusions:
Image-based robotic THA demonstrates high accuracy in restoring hip joint anatomy, with a minimal deviation from planned acetabular component positioning. This precision is associated with significant improvements in functional outcomes, as evidenced by a substantial increase in HHS. At a minimum of 2 years follow-up, image-based robotic THA provides reliable, favorable results, suggesting its potential as a valuable tool in hip arthroplasty, particularly in elderly patients. Further studies with longer follow-up are warranted to assess the durability of these outcomes.

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P347

IS THERE A ROLE FOR THREADED CUPS IN ELDERLY PATIENTS WITH OSTEOPENIA UNDERGOING PRIMARY TOTAL HIP ARTHROPLASTY?

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Objectives:
There is limited information on the long-term success of threaded

cups in patients aged over 65 [1, 2]. Threaded, coated cups provide immediate mechanical stability, which may be advantageous for this demographic [3,4]. This study aims to evaluate clinical outcomes and complications associated with the use of the porous-coated EcoFit® SC threaded cup (ImplantCast) in elderly patients with osteopenia.

Material and Methods:

The study included 100 consecutive patients over the age of 65 who underwent total hip arthroplasty (THA) with the modified anterolateral minimally invasive (ALMIS) approach between 2014 and 2016 [5, 6]. All patients had a DEXA score between -1.5 and -2.5. We assessed implant survivorship, functional outcomes (Harris Hip Score), patient-reported satisfaction, and recorded complications.

Results:

Patients were followed for an average of 7.6 years (±1.2). The average age at surgery was 77.4 years (±5.5), with 78% of patients being female. The mean postoperative Harris Hip Score was 89.1, and the average satisfaction rating (scale 1–10) was 8.7 (SD 0.8). Two revisions were performed: one for prosthetic joint infection and another for aseptic loosening. Additionally, one patient experienced a traumatic dislocation, which was managed by closed reduction without further surgical intervention.

Conclusions:

Threaded, coated cups demonstrate favorable mid-term outcomes in elderly patients with osteopenia, potentially benefiting from their immediate mechanical stability [2, 3]. However, further studies are required to comprehensively understand the long-term performance of these implants in this patient population.

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FUNCTIONAL OUTCOMES AND COMPLICATIONS IN ROBOTIC IMAGE-BASED TOTAL KNEE ARTHROPLASTY: AN ANALYSIS OF 100 CONSECUTIVE PATIENTS WITH A MINIMUM OF 3 YEARS FOLLOW-UP

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Objectives:

Image-based robotic arm-assisted total knee arthroplasty (RATKA) using the Stryker Mako system (Mako Surgical Corp., Fort Lauderdale, FL, USA) has shown promising mid-term outcomes with minimal system-related complications [1-3]. This study aims to assess prosthesis survivorship, report complications, and document patient satisfaction and functional outcomes associated with this technique.

Material and Methods:

A retrospective analysis was conducted on 100 consecutive patients who underwent RATKA. Patient demographics, including age and gender, were recorded. The Oxford Knee Score (OKS) was collected preoperatively and at least two years postoperatively. Subjective satisfaction rates, complications, and any revisions were also documented.

Results:

The cohort consisted of 72 females and 28 males with a mean age of 72.6 years (SD = 5.8). The mean follow-up period was 41.2 months (SD = 3.6). One revision (1%) was performed due to prosthetic joint infection. Statistically significant improvements were observed in the Oxford Knee Score. Additionally, 97% of patients reported being "very satisfied" or "satisfied" with their outcomes. One case of a superficial pin-site infection in the tibia was noted and managed conservatively. No further system-related complications were observed.

Conclusions:

RATKA appears to be a safe and effective procedure with minimal complications, low revision rates, and favorable mid-term results [2, 4]. This study demonstrated high patient satisfaction,

improved clinical outcomes, and robust implant survivorship. While similar studies have confirmed the safety and efficacy of this technique, further research is required to investigate long-term implant survivorship [1, 3, 5].

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POLYMICROBIAL KNEE PROSTHETIC JOINT INFECTION: CAN LIFELONG ANTIMICROBIAL SUPPRESSION TREATMENT BE EFFECTIVE?

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Objectives:

This report details a case of polymicrobial prosthetic joint infection (PJI) in a 72-year-old woman, occurring three years after initial knee arthroplasty revision surgery. Periprosthetic polymicrobial infections with a fungus are extremely challenging in revised arthroplasties that require multidisciplinary approach [1-3].

Material and Methods:

We describe the patient's clinical and laboratory findings, along with her clinical progression.

Results:

The patient, a 72-year-old female with a history of diabetes mellitus, and obesity, underwent a two-stage exchange knee arthroplasty to address PJI. Initial cultures from the first stage identified methicillin-resistant *Staphylococcus aureus* (MRSA). After the second stage, the surgical wound appeared purulent. Surgical debridement was performed, with intraoperative cultures revealing both *Candida albicans, E. coli* and MRSA; blood cultures confirmed the presence of *Candida albicans*. The patient received intravenous fluconazole and vancomycin for four weeks. Due to comorbidities the patient was commenced on lifelong suppression treatment. At her four-year follow-up, she remained symptom-free with no signs of active infection.

Conclusions:

Fungal PJIs, though uncommon, present a complex treatment challenge necessitating a multidisciplinary approach [3, 4]. This case was polymicrobial with two bacteria and a fungus. The combination of two-stage revision surgery and extended antifungal therapy has been reported to be an effective management strategy [5, 6]. This case raises the question of whether life-long antifungal suppression could be a viable option in instances where additional surgery might result in poor outcomes due to technical constraints (e.g., severe bone loss, limited reconstructive options) or significant patient comorbidities. While complete infection eradication may not be achievable, the patient remains mobile and free of infection symptoms.

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THREADED CUPS IN TOTAL HIP ARTHROPLASTY: COMPLICATIONS RELATED TO THE IMPLANT AND THE PATIENT-SPECIFIC ANATOMY

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Objectives:
New-generation threaded acetabular components, such as the EcoFit® SC cup (Implantcast, Buxtehude, Germany), have shown positive outcomes in total hip arthroplasty (THA). These threaded cups offer immediate mechanical stability, which may be beneficial in achieving secure fixation, particularly in certain patient populations [1-4]. However, complications specific to this implant type have been observed, often related to surgical technique and patient anatomy. This report aims to present notable complications associated with the EcoFit® SC cup.

Material and Methods:
We reviewed a series of complication cases involving the EcoFit® SC cup in THA. Surgical techniques were assessed, with a focus on acetabular preparation and implant insertion. Specific attention was given to cases of acetabular roof and posterior wall fractures, as well as instances of incomplete component placement. We also considered patient anatomical factors and intraoperative findings to outline contraindications for the use of threaded cups.

Results:
Several complications were identified, including fractures of the acetabular roof and posterior wall, as well as incomplete placement of the threaded component. These complications were often associated with inadequate preparation of the acetabular rim, as the threaded cup diameter exceeds that of standard reamers used in acetabular preparation. In cases where the anterior or posterior acetabular walls were notably thin, torque forces exerted during implant insertion increased the risk of intraoperative fractures.

Conclusions:
While threaded acetabular components like the EcoFit® SC cup provide immediate stability and favorable outcomes in THA, careful consideration of surgical technique and patient anatomy is essential to avoid complications. Ensuring thorough preparation of the acetabular rim is critical to achieving proper component placement [2, 5]. Additionally, avoiding the use of threaded cups in cases with thin acetabular walls may reduce the risk of intraoperative fractures. Further studies are recommended to better define patient selection criteria and refine techniques to optimize outcomes with threaded cups in THA.

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MORPHOMETRIC STUDY OF SCIATIC NERVE AND ITS RELATION WITH SARCOPENIA IN PATIENTS WITH DISCOPATHY

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Objective: Patients suffering from chronic low back pain with associated sciatica, experience neurological symptoms in the lower back and leg. Ultrasonography (US) has been used recently to characterize sciatic nerves. And because of less daily activities and exercise in these patients are likely to experience sarcopenia. We examine the sciatic nerve with ultrasound in patients with LBP and unilateral radiculopathy (sciatica). We

evaluate the possible changes of nerve structure in patients with low back pain with unilateral sciatica due to lumbar disc herniation by ultrasound imaging and possible relation with sarcopenia. **Methods:** Forty - two (42) volunteers patients with 84 sciatic nerves, aged 22-81 years old, which complained for sciatica and they identified with lumbar disc prolapse in MRI, were studied with US (sciatic nerve). Age, sex, height, weight were recorded and the size and morphology of sciatic nerve were obtained. Sarcopenia was identified by muscle strength, muscle mass and gait speed assessment using the European Working Group on Sarcopenia in Older People (EWGSOP2) criteria. **Results:** The mean size of sciatic nerves were 0.578 ± 0.034 cm2 in males and 0.488 ± 0.03 cm2 females respectively. Pearson's correlation analysis showed that the mean size were correlated with height and weight. There was no difference in mean size among the different age. Women had smaller size of the sciatic nerves than men. Also the "pathologic sciatic nerves they have morphology of "edema" and the size were smaller in patients with recently diagnosed for disc prolapse in MRI, and in contrast enlargement sciatic nerves in patients with chronic sciatica, radiculopathy and positive MRI for disc prolapse more than 3 years ago (difference = 0.052 cm2). In addition, 23.3.% were diagnosed with probable sarcopenia and 4.8% with severe sarcopenia. Using regression analyses, sarcopenia was positively associated with sciatica (OR=0.12; CI 0.08-0.15); and age (OR=0.008; CI 0.004-0.01). **Conclusion:** Peripheral nerve ultrasonography is a reliable andreproducible diagnostic method in the hands of experienced examiners. The reliability aspect of measuring sciatic nerves and echointensity of the sciatic nerve with ultrasound in patients with LBP and unilateral radiculopathy has received little attention in the literature. Also the relative magnitude of fat/fibrosis infiltration were observed in all our cases of chronic sciatica and radiculopathy.The results of this study show that there is a positive correlation between sarcopenia and sciatica in patients with radiculopathy; this association had not been previously confirmed in Greece. Further research with larger sample is indicated in order clarify the precise association of specific characteristics of patients with sarcopenia and discopathy.

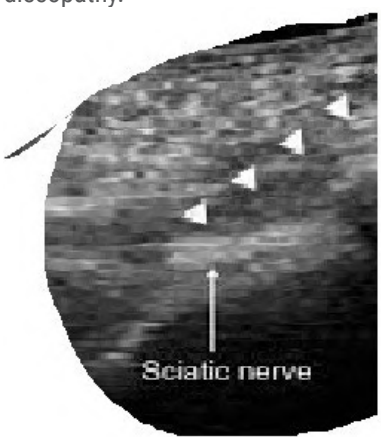

FIGURE - 1 - Sciatic nerve in ultrasound

Keywords: Sciatic nerve, sciatica, discopathy, disc prolapse, low back pain, sarcopenia, osteoporosis, ultrasonography of sciatic nerve

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KNEE OSTEOARTHRITIS. THE COMBINED ACTION OF POLYDESOXYRIBONUCLEOTIDE AND PULSED ELECTROMAGNETIC FIELDS

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Objectives/Introduction: Osteoarthritis (OA) of the knee is one of the most frequent degenerative cartilage pathologies. Scientific research has, in recent years, advanced new therapies that target adenosine A2 receptors, which play a significant role in human health against many disease states by activating different protective effects against cell damage. Among these, it has been observed that intra-articular injections of polydeoxyribonucleotides (PDRN) and Pulsed Electromagnetic Fields (PEMF) [1,2,3,4], can stimulate the adenosine signal, with significant regenerative and healing effects. The present paper highlights how intra-articular

injections of PDRN create beneficial effects by reducing pain and improving functional clinical scores.

Patients and Methods: A total of 63 patients, aged between 72 and 87 years old, affected by bilateral knee osteoarthritis, were enrolled in this study. They received PEMF therapy and PDRN injections on the right leg [PEMF therapy: Two- 30-minute sessions per week for a period of 6 weeks, while the left leg did not receive any treatment and served as control. An intra- articular amp containing PDRN (5,625 mgr./3ml) was administered during PEMF therapy. At baseline and 3 months post-PEMF/PDRN therapy, Visual Analog Scale (VAS) was used to assess knee pain and Western Ontario McMaster Universities Osteoarthritis Index (WOMAC) was used to measure knee pain, stiffness and physical function.

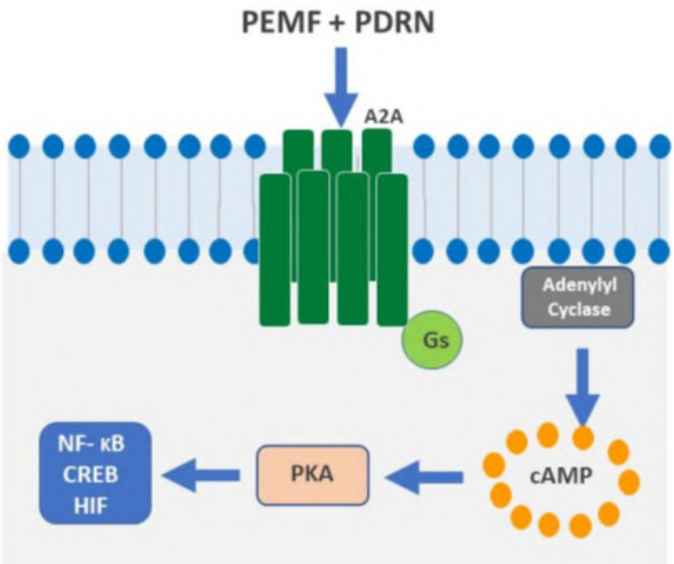
Results: Changes in VAS and WOMAC scores were calculated for both knees as baseline minus post-treatment. A two sample Student's t-test, comparing change in knee-related VAS pain for PEMF-PDRN treated leg (46.2 ± 1.34) vs control leg (10 ± 1.2), showed a significant difference in favor of PEMF - PDRN therapy ($P < 0.001$). A two sample Student's t-test comparing change in knee-related WOMAC pain, stiffness, and physical function for PEMF-PDRN treated leg (9.5 ± 0.3, 3.7 ± 0.2, 39.4 ± 2.11, respectively) vs control leg (2.2 ± 0.1; 1.6 ± 0.2; 4.3 ± 0.5 respectively), also showed a significant difference in favor of PEMF – PDRN therapy ($P < 0.001$). No adverse reactions to therapy were observed.

Conclusions: As has been shown, polynucleotides are polymeric molecules with a viscoelastic property because they bind large quantities of water molecules [1,3,5]. This allows them, as part of the treatment of osteoarthrosis (OA), to have the capacity to reorganize the articular cartilaginous structure through the regulation of the coordination and orientation of water molecules, thus increasing the moisture of the articular surfaces when the PDRN is injected into the joints [3,4]. As mentioned above, PDRN can inhibit metalloproteases of the extracellular matrix, thus reducing the degradation of extracellular matrix proteoglycans. Polynucleotides are also correlated to stimulating cell growth, collagen production, migration of anti-inflammatory cell types, and decreasing inflammation. The intra-articular use of PDRN yielded similar functional outcomes to HA, and the pain relief effect was superior for up to 2 months post-injection. Therefore, PDRN could be a favorable alternative to HA for treating knee OA with persistent pain, while also avoiding common HA side effects. Additionally, the pain-relief benefits of PDRN in clinical practice could offer a complementary role for other injection treatments. Adenosine replacement in the joint may be a new therapeutic approach to diseases involving cartilage damage, such as OA.

Keywords: Pulsed Electromagnetic Fields, (PEMF), Osteoarthritis (OA), Polynucleotides, PDRN

Conflict of interest statement

The authors declare no conflict of interest.



PEMF and PDRN Synergism

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PERCEPTION OF HEALTHY LIFESTYLE AMONG MEDICAL STUDENTS AND NON-MEDICAL UNIVERSITY STUDENTS

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Introduction / Objectives: Doctors have a special role in helping patients make lifestyle changes, and they are more effective if they are role models. The aim of the present study was to evaluate ideas and motivational attitudes of medical school students towards a healthy lifestyle and its components. The study aims also to assess behavioral lifestyle, to compare these behaviors between two groups of students (medical and non-medical) and found out the relationship between healthy lifestyle with their socio-demographic data.

Methods: The study was conducted from March until November 2024. We ran a medical and sociological survey of 386 randomly selected students from three universities. A comparative study was carried out. The data was analyzed using a descriptive and inferential statistical approach. A total of 340 students completed the Healthy Lifestyle and Personal Control Questionnaire (HLPCQ), which aims to assess the concept of empowerment through a constellation of daily activities. The article presents the results of the medical and non-medical students and sociological study aimed at assessing the ideas and motivational attitudes of medical students towards a healthy lifestyle and its elements.

Results: The findings reveal that healthy lifestyle behaviors toward all the students were moderate level within 79.3%, 74% (M±SD=105.22 ± 9.545), (M±SD=106.00 ± 9. 539) for medical and non-medical colleges students respectively. Our research showed that students at medical schools, while recognizing the importance of preserving their own health, are still largely committed to an unhealthy lifestyle, secondly, they refuse sports activities even more often than non-medical students, and, thirdly, they prove not to be active enough when it comes to disease prevention and health preservation.

Conclusion: Although lifestyle medicine knowledge is valued by medical students, appears to be ineffective in preventing worsening lifestyle behaviors. This is especially concerning as physicians are unlikely to provide effective guidance if they cannot sustain healthy behaviors themselves. Taking into consideration the obtained results, healthy lifestyle among students at medical schools is an exception rather than common practice.

Keywords: health, healthy lifestyle, medical students, motivation, Healthy Lifestyle and Personal Control Questionnaire. (HLPCQ)

Conflict of interest statement

The authors declare no conflict of interest.

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SHOULDER INJURIES IN CROSSFIT TRAINING AMONG MEDICAL STUDENTS-ATHLETES

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Introduction/Objectives: CrossFit has gained immense popularity over the last two decades[1,2,3], leading to an increased number of injuries, particularly to the upper extremities. Due to its competitive nature and high-repetition workouts, shoulder injuries are prevalent among CrossFit athletes, more so than traditional weightlifting. This multicenter study aims to familiarize clinicians

with CrossFit and review shoulder pathologies in young CrossFit athletes using MRI and clinical examination.
Patients/Methods: A survey was conducted among 47 CrossFit student-athletes from 5 different Universities. Forty-one participants (mean age: 23.5 years; 25 males, 16 females) with chronic shoulder pain underwent clinical and MRI examinations.
Results: The most common injuries included partial lesions of the supraspinatus tendon (48.78%), labral lesions (24.39%), subscapularis tendon lesions (17.07%), pulley lesions (12.19%), and infraspinatus muscle lesions (4.8%).
Conclusions: This study highlights the need for awareness and prevention of shoulder injuries in CrossFit [3,4]. Understanding injury patterns allows for targeted training adaptations and therapy. It is the first study to present structural shoulder changes in young CrossFit athletes.
Discussion: Current CrossFit research is limited, with most studies being case reports or series [3,4]. Although shoulder injuries are well-documented, high-level studies identifying modifiable risk factors and improving safety in training are needed.
Keywords: CrossFit; Exercise; Injury; Shoulder Injuries; Rotator cuff injuries
Limitations: Further research is needed to investigate whether the current findings hold for student population
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ANXIETY AND DEPRESSION AMONGST MEDICAL STUDENTS VERSUS NON-MEDICAL STUDENTS IN EUROPEAN UNIVERSITIES

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Objectives/ Introduction: Professional concern about perceived increases in student - mental health problems raises questions about whether questionnaire assessments can provide valid estimations of such disorders. The aim of this study was to validate the Hospital Anxiety and Depression Scale (HADS) against DSM-IV diagnoses in university students [1,2]. The target of the study is to assess the prevalence of anxiety and depressive symptoms in medical students compared to students of other faculties, and the possible impact those symptoms have on academic and educational achievements of the students.
Material and Methods: One hundred and fifty – eight students were administered with the HADS followed by the Structured Interview for DSM-IV. A cross-sectional study was conducted in this sample of 158 students: 45 medical students, 44 Physiotherapy students, 17 Nursing students and 52 non- health related students. All students anonymously completed a socio-demographic survey and the Hospital Anxiety and Depression Scale (HADS). Statistical analysis was performed using the Mann-Whitney test, Spearman correlation coefficient or Kruskal Wallis test. Results: We found a total prevalence of 20.8% (n = 33) for anxiety symptoms and 4.4% (n = 7) for depressive symptoms. Being a medical student was more significantly associated with symptoms of anxiety ($p = 0.032$) compared with other "categories" of students. Being a physiotherapy and nursing faculty student, was more significantly associated with NO symptoms of anxiety ($p = 0.022$) compared with others. Depressive symptoms were NOT associated with poor academic performance ($p < 0.01$) in all «categories»: of students. A percentage of 75.7% (n = 25) of students with anxiety symptoms and 71.4% (n = 5) of students with depressive symptoms did not "search" for medical or psychological care at that time. High HADS anxiety scores were not significantly associated with other measured indicators of serious mental health problems.
Discussion: Medical students in this sample seem to have more symptoms of anxiety than Physiotherapy and Nursing students. possibly explained by heavier and harder curriculum program in "Medical Faculties" and a higher number of female students in that sample. Depressive symptoms could not have an evident correlation with poor academic performance [1,3,4].
Conclusion: Considering the high levels of anxiety symptoms [1,4,5,], the possible impact of depressive symptoms in academic performance and the lack of psychiatric or psychological follow-up reported in this study, it is urgent to develop adequate means of support to improve students' well-being and mental health.
Limitations: Further research is needed to investigate whether the current findings hold for student populations with higher social diversity.
Keywords: Anxiety; Depression; Stress, Students, Medical, Physiotherapy, Nursing, academic achievement, educational perfor-

mance.
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INTELLIGENT SYSTEM PREDICTING RECOVERY OF SPINAL CORD INJURY PATIENTS BASED ON CLINICAL & ELECTROPHYSIOLOGICAL ASSESSMENT

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Objective: The pronounced association between Evoked Potentials (EPs) and American Spinal Injury Association (ASIA) scores in individuals with Spinal Cord Injury (SCI) indicates that EPs may serve as dependable predictive markers for the progression of rehabilitation. Numerous studies have confirmed that variations in somatosensory evoked potentials (SEPs) demonstrate a relationship with ASIA scores, particularly during the early stages of the disease. Additionally, Machine Learning (ML) has witnessed a notable increase in significance within the medical field, primarily due to the increasing availability of health-related data and progressive enhancements in machine learning algorithms. The present study aims to apply ML techniques to identify predictors linked to the progression of SCI as assessed by the disability index, ASIA Impairment Scale (AIS), and final motor recovery. Aiming to quantify the role of Electrophysiological testing including Sensory evoked potentials (SEPs), Motor Evoked Potentials (MEPs), and Nerve Conduction Studies (NCSs) additively used with clinical assessment in the prognostication of SCI, the present approach aided to formulate predictive models for disease progression, tailoring treatments adapted to each patient rehabilitation needs. The strategic utilization of data driven models could considerably elevate the quality of patient care, reduce healthcare costs, and promote the formulation of personalized and effective medical interventions.
Methods: We analyzed empirical data obtained from a free medical database consisting of 125 records resulted from a retrospective analysis of 748 individuals from the European Multicenter Study about Spinal Cord Injury (NCT01571531), showing associations between corticospinal tract (CST) sparing and upper extremity recovery in SCI, which improves the prediction of hand muscle strength recover as presented form Balbinot et al. (2023).Clinical assessment, as well as electrophysiological including Sensory evoked potentials (SEPs), Motor Evoked Potentials (MEPs), and Nerve Conduction Studies (NCSs) were taken as inputs for the prognostication of SCI based on upper limb Motor recovery and ASIA score. Different ML algorithms (Neural Networks, Decision Trees, Naïve Bayes and Ensemble algorithms as Voting) were tested to identify the best predictors (Figure 1).
Results: Most approaches revealed EPs as the best predictors compared with other Electrophysiological studies. Throughout our experimental evaluation, SEPs achieved an accuracy of 80%, which is close to the full electrophysiology evaluation that obtained an accuracy of 89% and are mostly better than MEPs and NCSs results for AIS scale determination. Additionally, SEPs achieved accuracies of 90%, which are comparable to full electrophysiology evaluation that obtained accuracies of 93%, and mostly better than MEPs and NCSs results for motor recovery prediction. SEPs could be established as the best predictors comparable to global electrophysiology assessment of SCI, resulting in more accurate efficacy than other diagnostic findings. Finally, an intelligent system was developed to predict the motor recovery of SCI incorporating the algorithm with the best accuracy performance (Table 1).
Conclusion: According to our results as well as other recent clinical studies, electrophysiology assessment should always be included, when available, as it elevates the total accuracy from only clinical investigation up to 93% (from at most 75%) for final motor recovery prediction, ASIA score determination, and consequently disease follow-up, up to 89% (from at most 66%). More data is needed to certify the above results. Finally, the Decision Support system that was developed as the objective alternative to ASIA scale, with the use of only sensory electrophysiology assessment data, resulted in up to 86% accuracy. Further investigation is necessary to quantify the importance of sensory electrophysiology assessment, which is significantly less expensive, portable, and simpler to administer than other prognostic tests, and more effective than clinical assessment methods, independently functioning as biomarker for SCI scaling and prediction of recovery possibility.

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Table 1: Accuracy results (Randomforest algorithm)

Biomarker accuracy (%)	Total	SEPs	MEPs	NCS	Clinical Assessment
Motor Recovery	**93,1**	91,9	86,6	85,4	**75,6**
AIS index	**89,0**	*80,1*	75,2	81,3	**66,3**

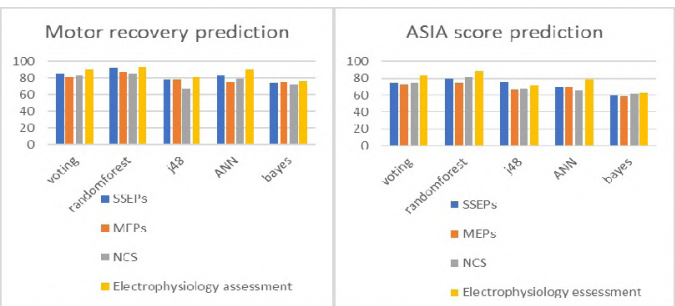

Figure 1: *Machine Learning prediction accuracy for different biomarkers. SEPs as well as the NCS are the most successful predictors for SCI patients with comparable performances.*

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DOES THE INTERFACING ANGLE BETWEEN PEDICLE SCREWS AND SUPPORT RODS AFFECT CLINICAL OUTCOMES AFTER POSTERIOR THORACOLUMBAR FUSION?

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Introduction/Purpose: Proper alignment and tightening of the pedicle screw/rod assembly after instrumented posterior fusion of the lower spine is known to be crucial in order to achieve satisfactory clinical results [1,2,3]. Such interfacing angle mismatches indicate stress overloading of the implant system. The objective of this study is to investigate the incidence of postoperative screw/rod interfacing angle mismatch and to analyze the impact of mismatches on clinical outcome in terms of (1) revision surgery, (2) adjacent segment degeneration (ASD), and (3) pain. This is a monocentric retrospective observational study.

Methods: Revision refers to subsequent procedures in which all or part of the original implant configuration is changed or removed. Radiographic parameters are evaluated using a/p and lateral radiographs at final follow-up. The interfacing angle mismatch between pedicle screw and rod is measured as the angle between two parallel lines on either side of each pedicle screw head and a line laterally along the associated rod. Multiple comparisons are counteracted by Bonferroni correction, adjusted significance level is at *p<.01.

Patient sample: Patients underwent fusion surgery with pedicle screw/rod systems for predominantly degenerative pathologies.

Outcome measures: Pedicle screw/rod interfacing angle mismatch (mismatch is the angular deviation from 90° formed by the rod axis and the pedicle screw head axis as an indicator for missing form-fit) revision rate, ASD at the immediately adjacent cranial segment and VAS pain.

Results: Pedicle screw and rod interfacing angle mismatch was found in 171/406 (42.1%) of patients undergoing fusion surgery, affecting 613/3016 (20.3%) screws. The overall revision incidence was 11.8% (48/406), and a new ASD occurred in 12.1% of all patients (49/406) with an average follow-up of 5 years. Mean VAS pain score at final follow-up was 2.0. Comparison of the two groups with and without mismatches revealed statistically significantly higher (1) numbers of revision procedures performed (26.9% vs 0.9%), (2) numbers of new ASD developed (27.5% vs 3.8%), and (3) higher VAS pain scores (2.8/10 vs 1.4/10) for cas-

es with mismatch. When comparing patients who underwent intraoperative correction and/or reduction with those who did not, statistically significant more screw mismatches (63.4% vs 39.7%) and revision surgeries (29.3% vs 9.9%) were noted in patients who had these forceful maneuvers.
Conclusions: Pedicle screw/rod interfacing angle mismatch is a frequent occurrence [4,5] after fusion surgery. Mismatches indicate that the construct was assembled under mechanical stress. All preventable mechanical stresses, for example, unintentional uncontrolled forces on the instrumentation, should be avoided as much as possible, as they can negatively influence the clinical outcome.

Keywords: Pedicle screw, Adjacent segment degeneration; Force control; Revision surgery; Screw/rod mismatch; Spine biomechanics

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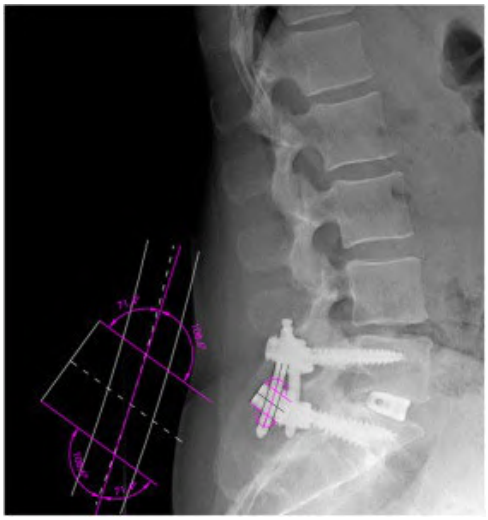

Picture 1: radiograph showing measurement of pedicle screw head/rod mismatch

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PSEUDOARTHROSIS OF THE OS - ACROMIALE IN BOXER-ATHLETES: THE IMPORTANCE OF DIAGNOSIS FOR SUCCESSFUL CONSERVATIVE TREATMENT WITH THERAPEUTIC EXERCISE

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Objectives/Introduction: Normally, the acromion of the scapula is formed by the synostosis of secondary ossification nuclei, but failure in this process leads to the formation of a fibrocartilaginous connection of the os acromiale (You et al., 2019, Macalister 1893). The incidence of os acromiale varies from 0.7% to 8.5%, depending on the population studied (Kumar et al., 2013, Aibinder et al., 2017, Sammarco 2000, Boehm et al., 2005, Rovesta et al., 2017), while the global prevalence appears to be around 7% (Yammine 2014). Hypotheses for the etiology of the pathology include mechanical stress and genetic causes, although there does not seem to be a bilateral expression of os acromiale. The diagnosis of os acromiale is difficult because patients often describe chronic pain symptoms similar to those of subacromial impingement, rotator cuff tear, such as painful and limited range of motion above head height, as well as pain when sleeping in a supine position on the affected side (Neer 1983, lebus et al., 2017, Guo et al., 2019). The os acromiale is usually evident on conventional radiographs, especially on ax-

illary radiographs (Ulrich et al., 2018, Burbank et al., 2007).The purpose of thiw study was to document the history and physiotherapy interventions for the treatment of a painful shoulder in four boxer-athletes, who was initiallyattributed to tendonitis, edema and a possible acromial stress fracture, before the diagnosis of os acromiale. Also the presentation of a successful post-diagnosis exercise program for the treatment of symptomatic os acromiale with follow-up 3 years after the intervention. **Patients and Methods**: Three right-handed boxer – athletes (17 -21 years old) with severe pain in the left acromion area, especially during abduction movements, but also during palpation, and positive clinical tests Neer, Hawkins, Whipple and Yocum tests examined. The athlete followed a series of physiotherapeutic interventions lasting 2 years without success until the diagnosis of os acromiale was made with MRI - CTs. After the diagnosis, the athletes followed a strengthening program of 11 exercises for a total duration of 8 months, (5X10 repetitions, 4 times a week). **Results**: After the implementation of the 8-month exercise program, full range of motion in abduction was achieved, painless abduction with resistance, painless palpation of the acromion in all patients. Also, the clinical tests Neer, Hawkins, Whipple, Yocum were negative. After the 8-month period of implementation of the exercises to treat the os acromiale, the athletes returned to systematic exercise and sports and continue with maintenance exercises3 times a week. Three years later, following the maintenance program 3 times a week, he has no pain, nor any limitation in shoulder movements. **Conclusions:** The treatment of the acromion in athletes involved many challenges. Initially, in the first therapeutic approaches, the acromion (os acromiale) was not diagnosed as the cause of the imaging findings. Thus, the exercise regimen that was applied was to strengthen the rotator cuff muscles, due to the symptoms that referred to subacromial friction syndrome. Then, due to the nature of the sport of boxing, which requires strong tachydynamic muscle contractions in abduction, internal and external rotation of the shoulder. Also, movements above shoulder height when appropriate, as well as responding to rapid reaction movements of the opponent during boxing. Finally, the patient's age and the type of acromion (convex type II according to Bigliani), which did not allow for a surgical approach, as the possibility of permanent motor dysfunction, as well as rejection of the bone graft, could not be ruled out. The holistic approach through exercise used here focused on the global strengthening of the shoulder joint (focused strengthening of the rotator cuff and stabilization of the scapula of the affected side), with a greater number of exercises. In conclusion, shoulder pain can be due to a multitude of pathologies, with similar symptoms, so the need for a clear diagnosis of an os acromiale as a source of pain and dysfunction and the exclusion of other pathologies becomes important, while it is a necessary condition for a successful conservative treatment, focused on the pathology. Equally important is the maintenance program that must be followed systematically, in order to maintain the strength of the muscles in the area, especially in the affected shoulder.

Key words: os acromiale, shoulder pain, conservative treatment, boxing

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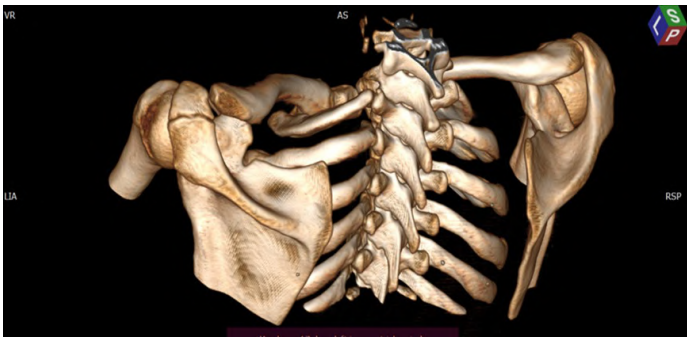
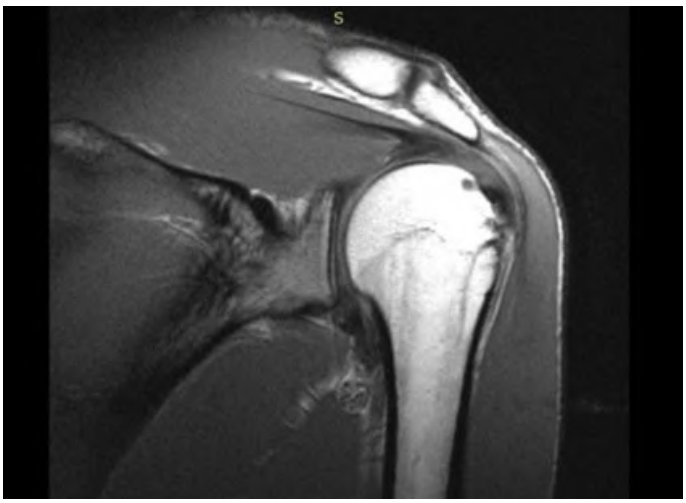
Picture -1. The BOXER-athletes followed a strengthening therapeutic exercise program



Picture - 2. CT scan of Os - acromiale - 17 years old boxer



Picture - 3. MRI scan of Os - acromiale - 20 years old boxer

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CROSS-CULTURAL ADAPTATION FOR FREEZING OF GAIT'S QUESTIONNAIRE ON PARKINSON'S PATIENTS IN GREEK LANGUAGE

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Introduction: Patients with Parkinson's, which is one of the most common degenerative neurological diseases, have frequent gait disturbances, difficulty in taking the first step and "freezing" during their gait. The Freezing of Gait Questionnaire (FoGQ) is perhaps the only self-reported means of assessing this symptom, but it is not available in English.

Purpose: The present study conducted as part of a pre-graduate thesis aims at the cross-cultural adaptation of the Freezing of Gait Questionnaire in Greek and the pilot application of the final translated version in a group of Parkinson's patients in order to test comprehension and reliability.

Materials and Methods: With the authors' approval, the questionnaire was adapted into Greek through forward translation, re-translation and necessary modifications. It was distributing to 10 Parkinson's patients (5 male, 5 female), following written consent to ensure content understanding. Inter-rater reliability was tested by comparing responses from two independent raters, while test-retest reliability was evaluated by redistribution the questionnaire, after 14 days. Statistical analysis was performed using the intraclass correlation index (ICC), with the SPSS version 28.1.

Results: The translations were implemented without any particular difficulty and the pilot implementation demonstrated full understanding of the content of the translated questionnaire. Both inter-rater reliability (ICC=0.901, p>0.001) and inter-rater reliability (ICC=0.901, p>0.001) were found to be extremely high. The internal consistency index came out very high (cronbach's α = 0.835).

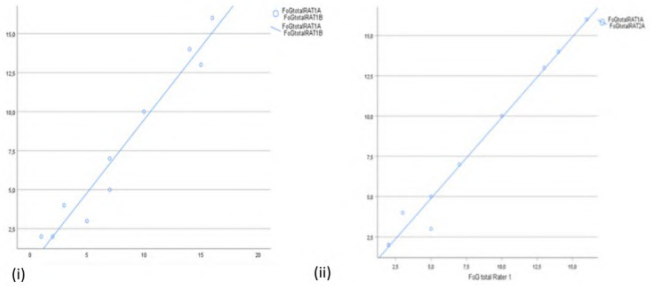

Figure 1: Reliability assessment i) between first (A) and second (B) assessment *(test-retest reliability)* and ii) between first (RAT1) and second (RAT2) raters *(inter-rater reliability)* on FoG questionnaire total score (n=10)

Conclusions: This study suggests a reliable, user-friendly tool with high consistency across assessors and repeated measures. Further testing on a larger sample is needed to assess validity, responsiveness, and sensitivity before widespread use in Greek clinical settings.

Keywords: Parkinson, freezing of gait questionnaire, reliability

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BILATERAL ARM TRAINING VERSUS CONSTRAINT INDUCED MOVEMENT THERAPY FOR IMPROVING UPPER LIMB MOTOR FUNCTION AND DEXTERITY AFTER STROKE, A SYSTEMATIC REVIEW

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Objective Among many treatments to improve motor function and dexterity of the hemiplegic upper limb (UL) post stroke (1) are bilateral exercise (BAT) and restrictive motor therapy (CIMT)(2), (3). The present study aims to compare the effectiveness of the two methods on the motor function and skill of AA after stroke.
Materials and Methods Systematic review of randomized control trials in the electronic databases Pubmed, PEDro and Science Direct from 01/01/2000 to 31/12/2022 in English, with keywords defined by PICO (Population, Intervention, Comparison, Outcome) and MeSH terms. Quality assessment was performed using the Cochrane risk of bias 2 (RoB2) tool for RCTs. Data were extracted in terms of outcome measures for motor function, activities of daily living and dexterity.
Results After searching the databases, in total 20827 articles were collected. By removing duplicates and checking the inclusion and exclusion criteria, 134 studies were included for full text screening and from these finally 5 studies were included in the systematic review. Total sample consisted of 198 participants, of which 138 patients (3 studies) were in the chronic stage, 30 patients (1 study) in the subacute stage and 30 patients (1 study) in the acute stage. The duration of the therapeutic intervention ranged from 3 to 4 weeks. When controlling for bias, two studies were classified as "low risk" and three as "high risk" (Fig 2). Significant improvement was seen in motor function with both the application of CIMT and BAT. Moderate evidence was found for the superiority of BAT over CIMT in improving proximal UL movement disorders. Also with moderate evidence, CIMT was revealed as more effective than BAT in activities of daily living. Finally, regarding the dexterity, the results were contradictory as far as the superiority of BAT compared to CIMT was concerned.

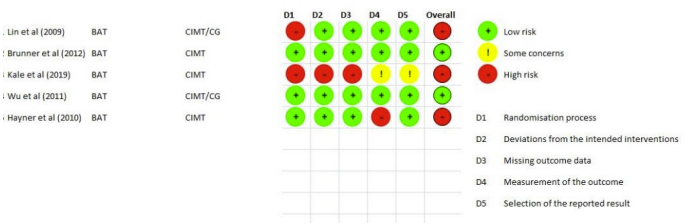

Figure 1. Risk of Bias assessment of the 5 Randomized Controlled Trials finally included in the Systematic Review, as it was conducted with the RoB tool of Cochranes´ Library

Conclusions The lack of evidence regarding the superiority of either intervention, alongside the positive effects of both on UL motor function and dexterity highlights both equally for UL retraining after stroke. Future systematic investigations may include motor assessment and meta-analysis.
Key words: stroke, hemiplegia, bimanual exercise, constraint induced movement therapy, motor function
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P361

«THE EFFECTIVENESS OF A PILATES PROGRAMME IN THE IMPROVEMENT OF STATIC AND DYNAMIC BALANCE IN PATIENTS WITH MULTIPLE SCLEROSIS

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Objective The aim of this study is to assess the effectiveness of Pilates method in the enhancement of static and dynamic balance (1,2), in comparison to conventional physiotherapy program in patients with Multiple Sclerosis (3).
Materials and Methods A total of eighteen patients, participated in the study (8 males, 10 females, of 58±8 years of age), and they were divided equally into two intervention groups (Pilates, conventional therapy) and one control group. Intervention programs were undertaken 2 times per week, in 45 minutes-sessions, for a total of 8 weeks. Assessments were conducted before the initiation of the intervention (baseline), in the middle of the intervention (4 weeks), at the end of the intervention (8 weeks) and one month later (follow up). The primary outcome measures were the static and dynamic balance. The assessment tools consisted of a stable force platform «Bertec Acquire 4», the scale «Mini Balance Evaluation System Test», the «Functional Gait Assessment» scale and the «Short Physical Performance Battery» scale. The secondary outcome measures included the lower limb motor function through the «Fugl – Meyer Sensorimotor Assessment».
Results The duration of the single-leg support on the left lower limb increased in the intervention groups for both the Pilates method (3.9±1.85 sec) and the conventional physiotherapy (1.2±0.55 sec) compared to the control group, in which the duration decreased by 1.87±0.42 sec. The CoP displacement area in all static balance tests on the force platform («eyes open, legs together», «eyes closed, legs together», «single standing on left-leg», «single standing on right-leg», «tandem left», «tandem right»), did not show

statistically significant differences, both within groups due to the intervention and between the groups. Furthermore, the overall performance on the mini-BESTest improved in both the Pilates (by 3.29±1.7 in the total score), and in the conventional physiotherapy group (by 4.6±2 in the total score), compared to the control group in which it decreased by 1.6±6.7. These results did not lead to statistically significant differences (p>0.05) (Fig. 1). Dynamic balance, as assessed through walking, recorded a statistically significant improvement after the intervention (F(1.81, 25.36)=6.59, p=0.006, np2=0.32), but without a statistical difference between the groups (p>0.05).

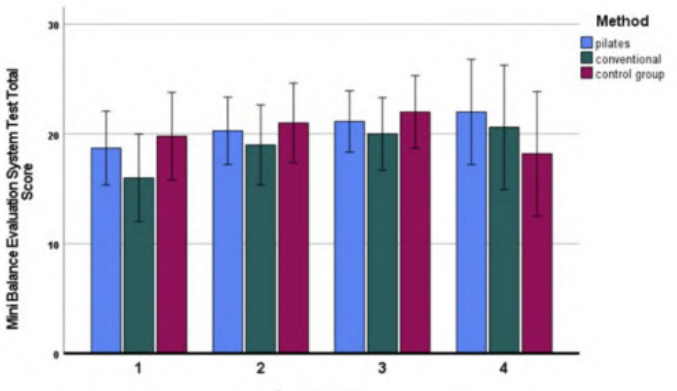

Figure 1: Changes in balance, as assessed by the Mini Balance Evaluation Systems Test (mini-BESTest) scale (total scores), between baseline (1st measurement), mid- intervention (2nd measurement), at the end of the intervention (3rd measurement) and during the repeated measurement (follow up) one month after the end of the intervention (4th measurement). Data from (n=17 patients).

Conclusion Results suggest that Pilates method improved the static and dynamic balance and lower limb mobility, however it does not surpass conventional therapy. In conclusion, further research is required in the future.

Keywords: Multiple Sclerosis, Pilates, postural control, postural control, dynamic balance

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P362

THE EFFECT OF RESISTANCE - EXERCISE ON ALKALINE PHOSPHATASE LEVELS IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS AND SARCOPENIA

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Introduction/Objectives: Alkaline phosphatase (ALP) is an enzyme that plays an important role in the calcification of osteoid (the non-calcified part of bone) and mineralization. The cell membrane of osteoblasts is rich in alkaline phosphatase, the concentrations of which increase in the blood when there is intense activity by osteoblasts. Alkaline phosphates are widely used as a marker of bone formation, but is not specific for bone turnover (Marini et al., 2020). Total ALP is examined by measurements of the alkaline phosphatase enzyme in the bloodstream (Kuo et al., 2017). The aim of the study was to examine the effect of a 6-month resistance exercise program on blood alkaline phosphatase levels in postmenopausal women with osteoporosis and sarcopenia who were not previously exercising.

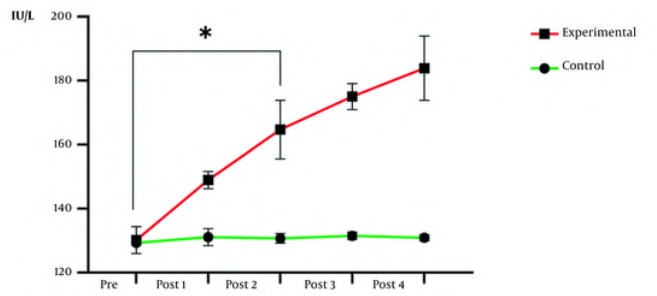
Patients and Methods: A total of 46 women aged 59.06±7.56 years, body weight 74.78±6.79 kg, height 156.93±7.23 cm participated in the study and established the typical inclusion criteria [postmenopausal women with sarcopenia and osteoporosis]. Of these, 35 individuals aged 54.2±7.81 years, body weight 79±8,69 kg, height 159.8±6.32 cm, completed the initial and final blood sampling before the start and at the end of the 6-month exercise program for the measurement of alkaline phosphatase. The exercise program was performed 3 times a week for 60 minutes each time. It included resistance exercises of the large muscle groups of the upper and lower extremities in 4 sets of 10 repetitions with dumbbells, bars and elastic straps as well as the use of body weight. In six women which had the economic "capacity" biomarkers (IL-6, TNF, CRP, P1NP, sCTX) were measured also.

Results: Blood alkaline phosphatase levels increased by an average of 11% in the second blood draw (104.8±39.1) compared to the first blood draw (93.8±38.1), approaching 42% in some cases, however with a large variation. Also looked at the levels of inflammatory biomarkers (IL-6, TNF, CRP) in a group of 6 postmenopausal women before and after the six-month exercise intervention - training dramatically decreased IL-6, TNF-, CRP. Procollagen type 1 N-terminal peptide (P1NP) also increased significantly after six months of training, while collagen type 1 cross-linked C-telopeptide (sCTX) did not rise significantly (K. Zemanidis 2023).

Conclusion/Discussion: Systematic 6-month resistance exercise in postmenopausal women had a positive effect on increasing osteoblastic activity, as assessed by blood alkaline phosphatase concentrations. The present study outlines the beneficial effect of resistance training in postmenopausal women, preventative and therapeutically. The optimal program has not yet been determined. Heterogeneity of studies creates ambiguity in the production of guidelines. Higher-quality studies provide evidence that axial loading at moderate to high intensities combined with progressive resistance training is the most efficient stimulus (K. Zemanidis 2023). Our study outlines, that, even for women with low to extremely low BMD, and sarcopenia, high-intensity exercise seems to be a safe treatment strategy when done under the right supervision.

Keywords: Osteoporosis, Sarcopenia, postmenopausal women, exercise program, biomarkers

Conflict of interest: I declare that I have no conflicts of interest related to this research/study/project.



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P363

SHORT- AND LONG-TERM EFFECTS OF SOFT TISSUE MOBILIZATION AND EXERCISE ON SWAY BACK POSTURE AND CERVICALGIA PATIENTS

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Objectives: The study was conducted to compare the short- and long-term effect of combined soft tissue mobilization techniques (massage and Ergon IASTM Technique) along with a comprehensive strengthening and stretching exercise program for correction of sway back posture and reduction of neck pain in cervicalgia and postural abnormalities.
Material and Methods
Thirty participants (12 males, 18 females) aged 20–34 years suffering from neck pain for at least three months and exhibiting sway back posture were randomized into two Group A was given soft tissue mobilization techniques and strengthening and stretching exercises for cervical and thoracic areas. Group B did all the same, with the addition of trunk exercises. Both groups received 4 weeks of therapy (3 times/week) and performed exercises at home until the 8th week. Assessments performed at the baseline, after the 6th and 12th sessions, and at the 8th and 16th weeks included forward head projection, trunk sway, lumbar lordosis, cervical range of motion (ROM), neck muscle strength, and pain (VAS).
Results Both groups experienced significant improvements in forward head projection, trunk sway-back posture, and pelvic tilt following treatment. The differences in forward head and sway-back posture were significantly improved for group B (intervention + trunk exercises) at 8th week. Group A and Group B both demonstrated improvements in ROM, but Group B was superior in flexion, right lateral flexion and rotation, while Group A demonstrated superiority in extension and left lateral flexion. The strength of cervical flexion and extension was superior in Group B until the 8th week. Pain relief was significant for groups until the 12th session, with Group B reporting greater relief. No group maintained benefits at the 16th-week follow-up.
Conclusions A combined intervention of soft tissue mobilization, strengthening, and stretching exercises for the trunk and cervical region can improve postural alignment, ROM, and pain in individuals with sway back posture and cervicalgia. Long-term benefits require ongoing intervention to sustain improvements.

P364

THE EFFECTS OF ERGON IASTM TECHNIQUE AND CORE STABILITY TRAINING ON THE SWAY BACK POSTURE AND PAIN IN PATIENTS WITH KNEE OSTEOARTHRITIS

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Objectives: To investigate the effect of the Ergon IASTM Technique, along with local knee strengthening exercises and core stability exercises, to improve sway back posture and decrease pain in patients with knee osteoarthritis. Material and Methods: A total of 18 participants (9 women, 9 men) with sway back posture and knee osteoarthritis were randomly assigned to either a control group (n= 7) and experimental group (n= 5). Group A received 10 minutes of massage, 20 minutes of Ergon Technique, knee strengthening and knee stretching. Group B performed the same protocol with core stability exercises and trunk stretching. The intervention was delivered over 6 weeks, consisting of 12 sessions (2 per week). Participants continued with a home-based exercise program during the study. Also, images on the sagittal plane were taken for postural evaluation by observing (1) forward head posture, (2) the angle of trunk sway, (3) pelvic tilt, and (4) knee hyperextension. Pain was assessed with the Visual Analog Scale (VAS). Results: There was a significant improvement ($p < 0.05$) in forward head posture and trunk sway angle after the first session in both groups. However, these gains were not sustained over the following sessions. No difference in change in pelvic tilt occurred in either group. Pain scores in both groups improved significantly during the first seven sessions ($p < 0.05$), with Group B showing a significantly higher reduction in pain in comparison to Group A ($p = 0.022$). Conclusions: Combining the Ergon Technique, knee strengthening and core stability exercises decreased pain levels more than group A. Incorporation of the core stability exercises likely enhances the outcomes of soft tissue mobilization in patients with knee osteoarthritis and sway back posture.

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NEUROMUSCULAR PREDICTORS OF PERFORMANCE IN THE MODIFIED ATHLETIC SHOULDER TEST IN SWIMMERS

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Objectives

The modified Athletic Shoulder Test (mASH) (2) is an innovative upper extremity assessment tool suitable for replicating shoulder muscle contraction in sports involving repetitive overhead movements such as swimming (1). However, the neuromuscular factors associated with mASH test performance have not yet been elucidated.The present study aimed to identify neuromuscular predictors of mASH performance in swimming athletes.

Materials and Methods

Eighteen (18) healthy swimmers (13-17 years old) underwent a holistic musculoskeletal assessment during the pre-season period, which included: the mASH test, the assessment of isometric strength of the internal rotators (IR) and external rotators (ER) of the shoulder with a handheld dynamometer, the Closed Kinetic Chain Upper Extremity Stability (CKCUES) test to assess shoulder stability, the Biering-Sorensen test to assess back muscle endurance, the Shoulder Endurance Test (SET) to assess the endurance of shoulder external rotators, the Posterior Endurance Shoulder Test (PSET) to assess the endurance of the trapezius muscles, as well as the range of motion of shoulder external rotation. The stepwise multiple regression models included the variables with a significant correlation ($p<0.05$).

Results

In the full abduction position (180 degrees) in the mASH test, the regression model included only the strength of the IR (Adjusted R-Square (Adj.R^2) 0,532, p=0,000) on the left and the strength of the IR along with CKCUES (Adj.R^2 0,55 $p<0.05$) on the right. At 135 degrees in mASH test, the model involved only ER strength (Adj. R^2 0,406 p=0,003) on the left and IR strength along with trapezius endurance on the right (Adj.R^2 0,63, $p<0,05$). In the 90-degree position in the mASH test, the model included the strength of the IR on the left (Adj.R^2 0,336, p=0.007) and on the right hand respectively (Adj.R^2 0,519, p=0,000).

Conclusions

IR and ER strength, shoulder stability, and trapezius muscle endurance contribute to mASH test performance, with IR strength being the most dominant factor. Exercises that strengthen these muscle groups may positively contribute to mASH test performance.

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P366

TACROLIMUS REDUCED CELL VIABILITY OF RHEUMATOID ARTHRITIS FIBROBLAST-LIKE SYNOVIOCYTES THROUGH INHIBITION OF AUTOPHAGIC FLUX

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Objectives: Rheumatoid arthritis (RA) is a chronic inflammatory autoimmune disease that causes inflammation and pain, and is characterized by hyperplasia of the synovial membrane and cartilage destruction. Tacrolimus is calcineurin inhibitor that inhibits inflammatory, and regulates cell death through the autophagy pathway during kidney and liver damage. But the mechanism underlying the effect of tacrolimus in RA remains unclear. We aimed to investigate the effect of tacrolimus on human fibroblast-like synoviocyte-rheumatoid arthritis (HFLS-RA), and determine whether it induces apoptosis.

Material and Methods: Cell viability and cell cycle progression were analyzed using hemocytometry and flow cytometry, respectively, after treating HFLS-RA with tacrolimus. Western blot analysis was performed by pretreating the cells with the autophagy inhibitors 3-Methyladenine(3-MA) and Bafilomycin A1(BafA1) to determine the effect on expression of proteins LC-3 and p62. To analyze the effect of tacrolimus on lysosomal function of tacrolimus, flow cytometry analysis was performed using LysoTracker, and Confocal was confirmed via double-staining for LAMP-1 and LC-3.

Results: When HFLS-RA was treated with tacrolimus at 0-80 μM, the cell viability decreased in a concentration-dependent manner to 20%, 60%, and 93%, respectively, and in a time-dependent manner to 23%, 53% and 65%, respectively at 8-24h. Regarding the cell cycle progression, the number of cells in the sub-G1 stage increased in a concentration-dependent manner (control: 6.05%, 40 μM: 11.5%, 60 μM: 33.45%, and 80 μM: 61.5%). Increased LC-3 II protein expression and decreased p62 protein expression were offset when cells were treated with the autophagy inhibitor 3-MA, but not when they were pretreated with BafA1. Confocal confirmed an increase in the formation of LAMP-1 puncta in HFLS-RA treated with tacrolimus, however, LC-3 was within the nucleus, and puncta were barely formed.

Conclusions: Our findings revealed that tacrolimus does not induce apoptosis in RA but induces autophagy. During autophagy, lysosomes accumulate in cells owing to lysosomal dysfunction, suggesting that apoptosis may occurs. Further research is needed to elucidate the precise mechanism by which tacrolimus induc-

es cell death by lysosome dysfunction in autophagy, and understanding these interactions will aid in the development of future targeted therapies.

P367

LOW-DOSE FEBUXOSTAT EFFECTIVELY REDUCES URIC ACID LEVELS IN GOUT PATIENTS WITH CHRONIC KIDNEY DISEASE: RESULTS FROM THE TWO-YEAR FOLLOW-UP STUDY OF THE URATE LOWERING THERAPY (ULTARA) REGISTRY

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Objectives: Gout is an inflammatory arthritis caused by hyperuricemia and is highly prevalent in patients with chronic kidney disease (CKD). Reduced renal function in CKD patients impairs uric acid excretion, contributing to the development and progression of gout. This study aimed to analyze longitudinal changes in uric acid levels according to stages of CKD in patients with gout. In addition, febuxostat dosage was compared in the normal and CKD groups over a 2-year period.

Material and Methods: A total of 516 patients enrolled in the Urate Lowering TheRApy (ULTARA) registry over a 2-year period were compared to the uric acid levels at baseline, 6 months, 1 year, and 2 years among the normal, CKD stage 3 and CKD stage 4-5 groups. The febuxostat dosage at each time point was compared in 182 patients who were exclusively using febuxostat in this registry.

Results: The baseline uric acid levels were significantly higher in CKD 3 and 4-5 groups (9.0 ± 1.9 mg/dL and 10.2 ± 2.0 mg/dL) compared to normal group (8.4 ± 1.7 mg/dL, P<0.001). After urate-lowering therapy, the uric acid levels were lower in CKD groups compared to those in normal group over a 2-year period. Meanwhile, among the patients using febuxostat, the mean dosages of febuxostat were lower in CKD groups (40.5 ± 17.6, 39.2 ± 13.8, 40.0 ± 12.6 in CKD stage 3, and 40.0 ± 20.0, 37.5 ± 22.5, 20.0 ± 0.0 in CKD stage 4-5) compared to those in normal group (47.7 ± 19.1, 48.1 ± 20.2, 60.0 ± 20.0) at 6-month, 1year and 2years, respectively.

Conclusion: In gout patients with CKD, uric acid levels were well-controlled with urate-lowering therapy, even though the lower febuxostat dosage compared to that in patients with normal renal function. Therefore, uric acid levels can be effectively reduced in CKD patients using lower doses of febuxostat.

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FRACTURE RISK IS ASSOCIATED WITH INTRINSIC CAPACITY IN OUTPATIENTS ASSESSED FOR OSTEOPOROSIS

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The incidence of fragility fractures has become an urgent health issue as the global population ages. Intrinsic capacity (IC) is defined by the World Health Organization (WHO) as the combined physical and mental capabilities an individual can draw on.

Objective: This study investigates the association of IC with fracture risk in postmenopausal women.

Material and Methods: The five domains of IC model were assessed in accordance with the Integrated Care for Older People (ICOPE) guidelines. Patients' characteristics including comorbidities evaluated by the Charlson Comorbidity Index (CCI), the FRAX derived 10-yr clinical risk for fragility fracture, BMD detected by DXA and muscle strength measured by Jamar dynamometer, were also taken into consideration.

Results: 202 postmenopausal women (mean age 68.1 ± 8.6 yr) were consecutively recruited. All but 5 (2.5%) presented impairment in at least one IC domains. By classifying the participants into groups according to FRAX- i.e. low, intermediate, and high fracture risk - a significantly different distribution of patients with IC impairment was observed (p<0.05). The number of compromised domains was positively associated with the 10-yr probability of major osteoporotic fracture (r=0.392, p<0.001) and the CCI (r=0.335, p<0.001); and it was negatively associated with handgrip strength (r=-0.471, p<0.001). At multiple regression analysis, the preserved visual function was associated with reduced prevalence of fragility fracture (OR=0.2545, CI 0.0693 to 0.9349). The very high fracture risk (FRAX score >20%) was independently associated with hearing loss (OR=2.3908, CI 1.2689 to 4.5046), malnutrition (OR=4.0114, CI 1.5091 to 10.6630) and limited mobility (OR=2.7898, CI 1.4650 to 5.3127); the latter (OR=0.4370, CI 0.2416 to 0.7904) was also associated with osteoporosis at the lumbar spine.

Conclusions: Our data suggest that IC evaluation could help physicians to identify patients at high fracture risk and may be promoted as routinary assessment in older persons.

P369

ROLE OF PLATELETS AND SYSTEMIC INFLAMMATION INDEX AS A MARKER OF FRACTURE RISK IN POST MENOPAUSE

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[1]University of Messina, Messina, Italy

Emerging experimental evidence highlights the potential involvement of platelets in the regulatory mechanisms underlying bone remodeling and the repair process following a fragility fracture.
Objective: The aim of our study was to investigate the role of platelets and the systemic inflammation index in postmenopausal women with osteoporosis.
Material and Methods: The following variables were evaluated from a complete blood count: platelet count, mean platelet volume (MPV), platelet distribution width (PDW), plateletcrit (PCT), percentage of large platelets (P-LCR), platelet-lymphocyte ratio (PLR), and the Systemic immune-inflammation index (SII, calculated as (NxP)/L, where N, P, and L are the counts of neutrophils, platelets, and lymphocytes, respectively). Bone mineral density (BMD) was measured using gold-standard dual-energy X-ray absorptiometry (DXA).
Results: Participants (n=124) were stratified into two groups according to the median platelet count; the "lower platelet count group" had a count of 200,000 (174,000 to 226,000), while the "higher platelet count group" had a count of 281,500 (256,500 to 308,500). A borderline significant difference (p=0.08) was noted for hip fracture risk, with a higher risk in the "higher platelet count group". A statistically significant difference was found in lumbar spine BMD between the two groups, with lower BMD in the "higher platelet count group" (p=0.03). Dividing the participants based on SII into two groups (higher and lower SII, respectively 950848.6±746097.9 vs 355751.2±88662.6; p <0.0001) a different estimated 10-year probability of femoral fracture was observed between the group with a higher SII value compared to the group with a lower value (10.5±10 vs 5.2±4.8%; p=0.01). Univariate regression analysis revealed a correlation between chronological age and PDW (r=0.188, p=0.047), and P-LCR (r=0.208, p=0.03), and an association between vitamin D status and P-LCR (r=-0.301, p=0.034).
Conclusion: The SII and total platelet count are markers of fracture risk and, due to their reproducibility and cost-effectiveness, their role could be further investigated in future prospective studies to enhance screening models for postmenopausal osteoporosis and fragility fractures.

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EXPANDING THE SCOPE OF THE FUNCTIONAL REACH TEST INDEX: COULD IT DETECT SARCOPENIA IN OLDER ADULTS?

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Amaç
Çalışmanın temel amacı, denge ve düşme riskini değerlendirmek amacıyla kullanılan fonksiyonel erişim test indeksinin (FRTI) yaşlı bireylerde sarkopeni ile ilişkili bağımsız bir parametre olup olmadığını değerlendirmek ve farklı sarkopeni tanımlarını öngören eşik değerini belirlemektir.
Malzemeler ve yöntemler
Bu kesitsel çalışmaya, ayakta tedavi gören 60 yaş ve üzeri hastalar dahil edildi. FRT, katılımcıların sabit bir pozisyonda ayakta dururken dengelerini kaybetmeden öne doğru uzanabildikleri maksimum mesafenin ölçülmesiyle gerçekleştirildi. FRT sonuçları boydan etkilendiği için, FRTI elde etmek için FRT ölçümü boy için ayarlandı. Muhtemel ve doğrulanmış sarkopeni tanımları kullanıldı: El kavrama gücünü değerlendirmek için bir Jamar hidrolik el dinamometresi kullanıldı ve kas kütlesi değerlendirmesi için bioelektrik empedans analizi kullanıldı. Temel demografik ve klinik veriler kaydedildi ve tüm katılımcılar için kapsamlı geriatrik değerlendirme yapıldı. Düşük FRTI ile sarkopeni tanımları arasındaki ilişki, tek ve çok değişkenli analizler kullanılarak değerlendirildi. Sarkopeniyi öngören optimum FRTI değerlerini belirlemek için ROC analizi yapıldı.
Sonuçlar
411 katılımcının %70,3'ü (n=289) kadındı (ortalama yaş 74,1±6,7 yıl). Ortalama FRTI 0,182 ± 0,03 cm/cm idi ve cinsiyetler arasında anlamlı bir fark yoktu. FRTI<20. persentil (<0,152 cm/cm) düşük FRTI olarak kabul edildi. Yaş, cinsiyet, BMI, eşlik eden hastalık sayısı ve geriatrik sendromların listesi ayarlandıktan sonra, düşük FRTI hem olası hem de doğrulanmış sarkopeni ile bağımsız olarak ilişkilendirildi (OR = 2,32 (95% CI = 1,05-5,12)] ve OR = 3,11 (1,35-7,15), sırasıyla). Muhtemel sarkopeniyi öngörmek için optimum FRTI eşiği ≤0,180 cm/cm (AUC = 0,789; duyarlılık = %87, özgüllük = %56,7) olarak belirlenirken, doğrulanmış sarkopeniyi öngörmek için eşik ≤0,173 cm/cm (AUC = 0,795; duyarlılık = %78,9, özgüllük = %66,5) olarak belirlendi.
Çözüm
Denge ve düşme riski değerlendirmesi için kullanılan FRTI, yaşlı yetişkinlerde sarkopeni riskini aynı anda değerlendirebilir. Bu nedenle, sarkopeni değerlendirmesi için zaman veya ekipman kısıtlamaları olan ortamlarda, düşme riski olan bireyler daha etkili bir şekilde belirlenebilir.

P371

ROMOSOZUMAB IMPROVES BONE MICROARCHITECTURE MEASURED BY TISSUE THICKNESS-ADJUSTED TRABECULAR BONE SCORE AT SIX MONTHS: A REAL-WORLD STUDY FROM OSWESTRY, UK

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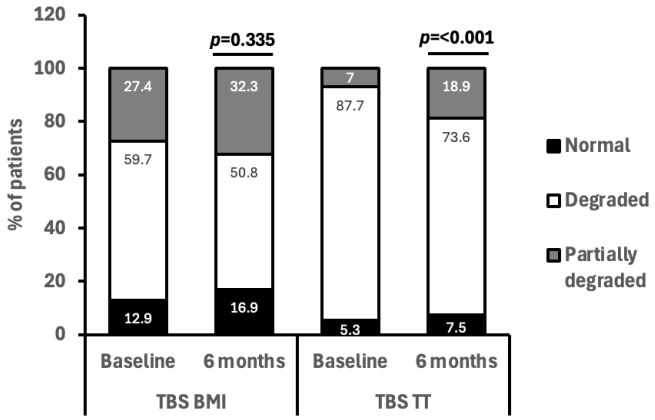
Objectives:
An updated trabecular bone score (TBS) algorithm accounting for regional soft tissue thickness (v4 TBS_{TT}) at lumbar spine (LS) has been developed to address some limitations associated with the body mass index (BMI)-corrected TBS (v3 TBS_{BMI}). This study evaluated early changes in bone microarchitecture measured by both TBS versions and bone mineral density (BMD) in response to romosozumab at six months in a real-world setting.

Materials and Methods:
This prospective observational study included postmenopausal women with osteoporosis and prior fractures initiated on romosozumab in a UK metabolic bone service. Percentage changes in TBS_{TT}, TBS_{BMI}, and BMD (Hologic Horizon®) at LS, total hip (TH), and femoral neck (FN) were assessed at six months using paired t-tests. TBS scores from both algorithms were categorised as normal (TBS > 1.31), partially degraded (1.23 < TBS ≤ 1.31), and degraded (TBS ≤ 1.23), with distributions at baseline and 6 months compared using Pearson chi-square tests. Response at six months was also assessed using least significant change (LSC).

Results:
Data from 69 patients (mean age 75.5 ± 7.2 years; 65% with vertebral fractures, 18% with hip fractures) were analysed. Baseline mean LS T-score was -2.65 (±1.3), FN T-score -2.8 (±0.7), and TBS_{TT} 1.160 (±0.06). Significant improvements in the group mean TBS_{TT} were observed (2.12%, p =0.003), while TBS_{BMI} increased numerically (1%, p = 0.290). BMD improved significantly at the LS (9.6%), FN (3.3%), and TH (3.5%), all p<0.001. Using LSC, a favourable response was observed for 83.8% of patients for LS BMD compared to 28.4% at TH, 34.3% at FN, p<0.05. Increases in TBS_{TT} and TBS_{BMI} exceeded LSC for 38% and 35% of patients, respectively. By 6 months, the proportion of patients with degraded TBS_{TT} decreased from 87.7% to 73.6%, while normal TBS_{TT} increased from 5.3% to 7.5% (p < 0.001). TBS_{BMI} distributions showed no significant changes (Figure 1).

Conclusions:
Romosozumab significantly improved bone microarchitecture as assessed by the tissue thickness-adjusted TBS (v4 TBS_{TT}) within 6 months. This version was more sensitive to change than TBS_{BMI} and should be considered in clinical trials and routine practice to evaluate treatment response.

Figure 1. Percentage of patients by TBS_{BMI} and TBS_{TT} risk category: Baseline vs. 6 months



P372

VALIDATION OF 30-DAY MORTALITY PREDICTION MODELS FOR HIP FRACTURES USING THE NSQIP DATABASE

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Objective: This study aims to validate our previously developed calculators to predict 30-day mortality, preoperatively and on-discharge, following hip fractures, using the National Surgical Quality Improvement Program (NSQIP) 2018–2020 database.
Material and Methods: We identified 58,840 hip fracture patients from the NSQIP 2018–2020 database and applied the originally derived equations and beta estimates from the same calculators we developed based on a prior database (2011-2017). The baseline characteristics of the populations in both databases were comparable. The only exception were some changes in the procedure used. Open reduction and internal fixation were less common, and intramedullary fixation became more prevalent, in the 2018-2020 database. We assessed performance using area under the curve (AUC) values for discrimination and Hosmer-Lemeshow goodness-of-fit test for calibration.
Results: The calculators maintained strong predictive performance in the updated cohort. The preoperative parsimonious model (10 variables: male gender, age, lower BMI, white race, poorer functional health status, higher creatinine, lower hematocrit, >10% weight loss in the prior 6 months, congestive heart failure within 30 days before surgery, and chronic obstructive pulmonary disease) achieved an AUC of 0.750 (R^2 = 0.9855), compared to 0.739 in the original cohort. The preoperative full model (16 variables) achieved an AUC of 0.755 (R^2 = 0.9836) compared to 0.742 in the original cohort. On-discharge parsimonious model (11 variables: all preoperative predictors except white race, hematocrit and > 10% weight loss in the prior 6 months, with the addi-

tion of unplanned intubation, cerebrovascular accident, myocardial infarction, and pneumonia) demonstrated an AUCs of 0.814 (R^2 = 0.999), and the full (27 variables) model an AUC of 0.826 (R^2 = 0.998), compared to 0.800 and 0.813, respectively, in the original cohort.

Conclusion: The validation of our mortality calculators using the NSQIP 2018–2020 cohort demonstrates sustained robust performance. This study highlights the continued relevance and utility of the parsimonious calculators for real-world clinical applications.

Disclosures: All authors declare having no conflict of interest with regards to the submitted work.

Figure. Area Under the Curve (AUC) for the Various 30-Day Mortality Prediction Models.

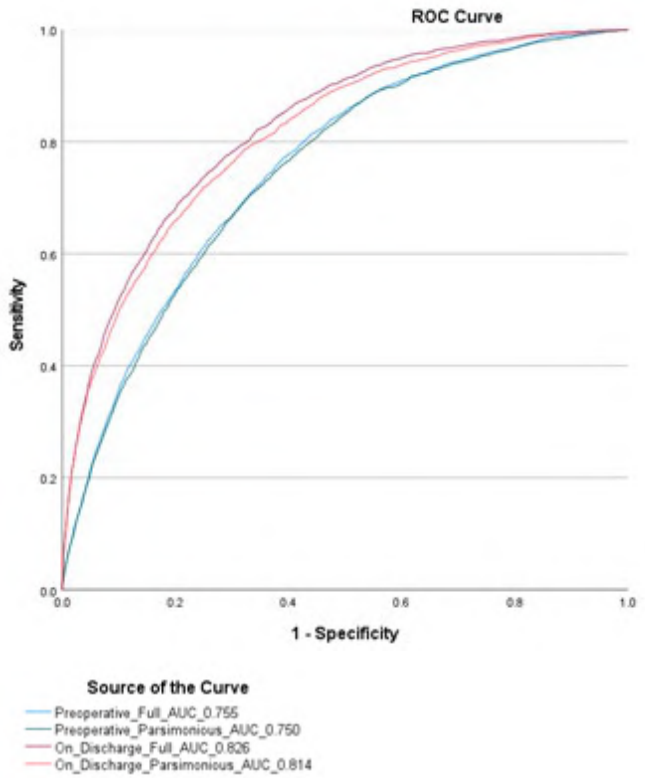

Figure legend. The preoperative full model consists of 16 variables, the preoperative parsimonious model of 10 variables; the on-discharge full model consists of 27 variables, and the on-discharge parsimonious model of 11 variables. Variables detailed under Results.

P373

IMPACT OF THE SECONDARY PREVENTION PROGRAM FOR FRAGILITY FRACTURES AT THE ORTHOGERIATRIC PROGRAMA AT FUNDACIÓN SANTA FE DE BOGOTÁ (FSFB) BETWEEN 2014-2024

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Objective(s): Assess the impact of the Secondary Prevention Program for Fragility Fractures at the Orthogeriatric Program of FSFB from 2014 to 2024, focusing on osteoporosis management outcomes and fragility fracture reduction

Materials and Methods: We analyzed a retrospective cohort study of 701 patients with hip fracture who underwent surgical management.

We used multivariate logistic regressions controlled for age, sex, BMI, screening for osteoporosis, pharmacological management for osteoporosis, preoperative levels of calcium, vitamin D and PTH and indication for osteoporosis treatment and bone densitometry at discharge.

Results: The mean age of patients was 83 years (SD: 8), with 77.5% being women and 22.5% men. The mean body mass index (BMI) was 19 (SD: 3). The program cares for a mean of 64 patients annually.

At the beginning of the program, it was not common to perform osteoporosis screening or provide treatment after discharge. Given the high-quality evidence supporting the importance of secondary prevention programs, we have implemented our secondary prevention program and these are the results: In 2014, 0% of patients were prescribe for osteoporosis however, over time, this improved: in 2022, 2023, and 2024, treatment was prescribed for 88.7%, 87%, and 66% of patients, respectively. Refracture rates for the hip or other bones were 11.6%, 5.6%, and 9.1% in 2022, 2023, and 2024, respectively. 51% of the patients who experienced a refracture had been prescribed osteoporosis treatment at discharge. However, we do not have data from previous years to compare the impact of osteoporosis treatment on fracture prevention. Vitamin D levels at admission were significantly associated with refracture rates: patients who refractured had a mean level of 24 ng/mL (SD: 11), compared to 28 ng/mL (SD: 13) in those without refractures ($p < 0.05$). Other variables were not significantly associated with refracture rates.

Conclusion (s): Our study highlights the significant progress in osteoporosis management within our orthogeriatric program, demonstrating a substantial increase in treatment prescription rates over the years. Vitamin D deficiency remains a major factor associated with refractures.

Disclosure: The author (s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this study.

P374

PREDICTORS OF 1-YEAR MORTALITY IN OLDER ADULTS WITH HIP FRACTURES TREATED IN A JCI-CERTIFIED ORTHOGERIATRIC CLINICAL CARE PROGRAM

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Objective(s): To assess one-year mortality and its predictive factors in older adults with hip fractures managed within a Joint Commission International (JCI)-certified Orthogeriatric Clinical Care Program (CCP) over a ten-year period.
Materials and Methods: This retrospective analysis of prospectively collected data included patients aged ≥65 years with hip fractures treated at Fundación Santa Fe de Bogotá between 2014 and 2024. Of 638 patients initially assessed, 411 were included in the final logistic regression model. Variables evaluated included age, sex, preoperative hemoglobin and vitamin D levels, nutritional status (Mini-Nutritional Assessment), functional status (Parker and Barthel indices), comorbidities (Charlson index), preoperative delirium, EQ-5D health state scores and intensive care unit (ICU) requirement. Logistic regression identified independent predictors of one-year mortality, and model performance was assessed using the area under the curve (AUC).
Results: Among 638 patients, 79 (12.3%) died within one year postoperatively. Severe preoperative immobility was strongly associated with mortality, with a 5.26-fold increased risk compared to good mobility (OR = 5.26; 95% CI: 1.57–17.17; p = 0.007). Patients with preoperative malnutrition exhibited 3.25 times higher odds of mortality compared to those with normal nutrition (OR = 3.25; 95% CI: 1.30–7.04; p = 0.010). High comorbidity was associated with 3.02 times higher mortality compared to low comorbidity (OR = 3.02; 95% CI: 1.30–7.04; p = 0.010). Higher preoperative hemoglobin levels were protective, reducing mortality risk by 22% per 1 g/dL increase (OR 0.78; 95% CI: 0.66–0.92; p = 0.003). ICU requirement during hospitalization was associated with 2.48-fold higher odds of mortality (OR = 2.48; 95% CI: 1.17–5.25; p = 0.017), while males were at increased risk compared to females (OR = 2.41; 95% CI: 1.05–5.57; p = 0.039). The logistic regression model demonstrated good predictive capacity (AUC = 0.822).
Conclusion(s): The one-year mortality rate of 12.3% in this cohort was notably lower than rates reported in the literature, underscoring the effectiveness of a comprehensive orthogeriatric care program. Identifying high-risk patients based on functional mobility, nutritional status, and comorbidities is critical to implementing tailored interventions and optimizing survival outcomes for older adults with hip fractures.
Disclosure: The author(s) declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this study.

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A COST-CONSEQUENCE ANALYSIS FOR GERIATRIC PATIENTS WITH FRAGILITY HIP FRACTURES TREATED AT HOSPITAL UNIVERSITARIO FUNDACIÓN SANTA FE DE BOGOTÁ (FSFB) BETWEEN 2018 AND 2022, BOGOTÁ, COLOMBIA

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Objectives: To determine the potential saving of the managing fragility hip fractures in the Orthogeriatrics Clinical Care Center (OCCC) at FSFB, compared to national and international benchmarks, using a cost-consequence analysis.
Materials and Methods: A cost-consequence study was conducted on patients aged ≥65 with fragility hip fractures who were candidates for surgical treatment, treated between 2018 and 2022 through the clinical care program at the OCCC of FSFB. This was compared to the 2022 National Annual Hip Fracture Registry of Spain and data obtained from a search of scientific publications in Colombia and worldwide. Outcomes at the time of surgery (in-hospital delirium, percentage of patients operated on within 48 hours, length of stay, and surgery time) and postoperative outcomes (surgical site infection and readmission within the first 30 days related to surgery) were considered. The analysis was performed from the perspective of the health system.
Results: The average cost of the procedure in Spain ranged from 9,231.9 to 10,723.9 dollars, in Mexico from 5,895.9 to 10,723.9 dollars, and in Colombia from 1,717.8 to 2,742.0 dollars. The outcomes at FSFB were better than the benchmark: delirium (-3.4%), patients operated on in less than 48 hours (39.2% more), length of stay (-3.92 days), and surgical site infection (-6%), while readmission rates were slightly higher by 1.06%. Due to the significant differences in costs, it was decided to keep the initial intervention and complication costs the same for both the benchmark and FSFB. This results in lower costs for short- and medium-term outcomes due to their frequency, leading to a savings of 3,235.23 dollars per individual per month of intervention. If 40% of the procedures in the city were performed by our OCCC, an annual savings of 21,399,105.31 dollars could be achieved.
Conclusions: The results demonstrate the efficiency and cost-consequence of the OCCC at FSFB in Colombia, where treatment costs are significantly lower than in Spain and Mexico. This demonstrates that higher-efficiency care model can lead to significant savings without compromising patient outcomes.
Disclosure: The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this study.

P376

MEDICATION RELATED OSTEONECROSIS OF JAW; EXPERIENCE IN A TERTIARY CARE CENTRE IN UK

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Background:
Medication related osteonecrosis of the jaw (ONJ) is a rare complication of anti resorptive therapy. It is often associated with pain, swelling, infection, exposed bone and pathological fracture of the jaw. It is known to occur after bisphosphonate therapy and denosumab which are used in osteoporosis (OP) as well as in multiple myeloma and metastatic cancers. While the risk of osteonecrosis of the jaw is much higher in patients with cancers, it is still reported in patients in whom these agents are used to treat osteoporosis.
There are additional risk factors such as IV/parenteral drug use, cancer and chemotherapy, long duration, higher dose, dental extractions, concomitant steroid use, poorly fitting dentures, smoking, diabetes and pre-existing dental issues.
Objectives:
To describe clinical characteristics of a case series of patients with osteonecrosis of the jaw
Methods:
Cohort of patients under the care of rheumatology and documented evidence of osteonecrosis of the jaw by an Orofacial maxillary surgeon were selected. Demographic characteristics, anti-resorptives used, additional risk factors and subsequent management of osteoporosis were described.
Results:
Of the 5 cases, all the patients were female. All of them were on anti-resorptive therapy when they developed ONJ. Four patients were on treatment for osteoporosis while one developed ONJ while on treatment for multiple myeloma. Of the 4 osteoporosis patients, 3 were on denosumab and another was on Alendronic acid. The other patient developed ONJ while on 3 weekly IV zoledronic acid infusions for multiple myeloma. Four cases developed ONJ after dental extractions while another occurred spontaneously on a background of poor dental hygiene. Of the 5 cases, 3 were on steroids. One was on low-dose prednisolone for rheumatoid arthritis, another was on budesonide for lymphocytic colitis and the other was on steroids as part of a chemotherapy regime.
Key message:
While fracture risk reduction following anti resorptive therapy is much higher than the chance of developing ONJ, it is important to assess the risk of ONJ prior to and during anti resorptive therapy. Patient education and proper consenting prior to initiation is of paramount importance. Dental extractions appear to be a common precipitant. Generally, the literature does suggest an increased risk of ONJ associated with denosumab which is the case in our case series. Similarly, another well-known risk factor is the use of concomitant steroids which is also seen in a majority the cases which we have described.

	Case 1	Case 2	Case 3	Case 4	Case 5
Gender	Female	Female	Female	Female	Female
Age in years	56	74	88	51	64
Risk factors For osteoporosis	Crohn's disease, inflammatory arthritis, oophorectomy	Chronic axial spondyloarthorpathy	Rheumatoid arthritis	Low body weight Lymphocytic colitis	Multiple myeloma Steroids
Fractures	Vertebral	Vertebral	No fractures	Wrist and vertebral	Vertebral
Treatment	Ibandronic acid 4 years of Denosumab	Ibandronic acid for 5 years 5 years of Denosumab	10+ years of Alendronic acid	Risendronic acid for 7 years Denosumab – two doses	IV Zoledronic acid – 3 weekly for 18 months
Risk factors	Following dental extraction Not on steroids	Following dental extraction Not on steroids	Following dental extraction Prednisolone	Following dental extraction Budesonide	No documented dental extractions Steroids as part of oncology treatments

Table 1 – demographics and clinical characteristics of our ONJ patient cohort

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VALIDATION AND ADAPTATION OF THE NOTTINGHAM HIP FRACTURE SCORE TO PREDICT 30-DAY MORTALITY IN HOSPITALIZED OLDER ADULTS FOR HIP FRACTURES

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Objectives: Hip fracture (HF) is a catastrophic event and it is associated with several biomedical, social and economic burdens. Identifying patients at high risk of 30-day mortality may help the decision-making for the optimal treatments.
The Nottingham Hip Fracture Score (NHFS) is one of the most reliable tools for assessing post-surgery mortality. This study aims to validate the NHFS in a cohort of Italian patients with HF and to identify variables enhancing the predictive model.
Methods: A multicenter prospective study was conducted in patients who underwent surgical treatment and received comprehensive assessment at admission, with data about 30-day survival status from regional death registries. Bivariate and multivariate logistic regression analyses were performed to assess the prediction of 30-day mortality. The predictive accuracy of the NHFS and adapted scores was measured using the ROC curves.
Results: 1189 patients were included, 72.5% women, aged 84.7±7.3 years. The 30-day mortality rate was 4.3% (n = 52). The NHFS distribution showed that most patients scored between 4 and 7, with the highest concentrations at scores of 5 (31.9%, n = 379) and 6 (28.1%, n = 334). The predictive capacity of NHFS versus ASA score for 30-day mortality was tested and the Area Under the Curve (AUC) for NHFS was 0.677, compared to 0.588

for ASA score, showing no significant difference (p=0.089). The revised NHFS with the addition of METs (Metabolic Equivalent of Task Score) showed the highest predictive power with significant differences in the ROC curves, and the modified NHFS was more accurate than the original.

Conclusion: The NHFS is a reliable tool for estimating 30-day mortality in Italian orthogeriatric patients undergoing HF surgery. The combination of revised NHFS and METs may improve the prediction power and accuracy of 30-day mortality.

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SYNERGISTIC MODULATION OF "IL6-TGFB" AXIS ENHANCES BONE LOSS IN T1R LEPROSY REACTION

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Introduction: Th17 cells have been previously implicated in the immunopathogenesis of T1R, contributing to both inflammation and bone loss. Cytokines such as IL-6, TGF-β, and IL-23 are critical drivers of Th17 cell differentiation. Therefore, understanding their specific roles in leprosy-associated bone loss is essential for immunotherapy.

Objective: To assess the role of IL-6, TGF-β, and IL-23 in Th17 cell differentiation augmenting bone loss in patients with leprosy T1R reaction.

Methods: 15 patients each with T1R and 15 non-reaction (NR) patients attending the leprosy OPD. For recruitment of patients, BMD was measured in the spine, femur, neck, and forearm by DXA. 48 hours PBMCs cultures were established with different combinations of recombinant human IL-6, IL-23, and TGF-β with or without *Mycobacterium leprae sonicated antigen* (MLSA). Subsequently, PBMCs cultures were blocked with either antagonized *sIL6R* or *sIL23R* antibodies. Real Time PCR was further used for gene expression analysis of *IL-17A, IL23A, IL-6, TGF-β, IL-6R, IL-23R* and *RUNX2, P1NP* (Osteoblast markers) and culture supernatant was estimated for cytokine ELISA.

Results: In this study, leprosy reactions (T1R-S) showed a significantly ($p<0.001$) high percentage of IL-17A producing $CD4^+IL6R^+$ T cells as compared to non-reaction (NR) patients. Surprisingly, osteoblast markers (*RUNX2* and *P1NP*) showed a significant ($p<0.02$) positive correlation with $CD4^+IL6R^+$ T cells. Furthermore, recombinant IL-6, IL-23, and TGF-β significantly ($p<0.001$) promoted IL-17A in $CD4^+IL6R^+$ T cells. Subsequently, IL-6R and IL-23R blocking experiments showed significantly ($p<0.01$) downregulated IL-17A in T1R reaction as compared to NR leprosy patients. Although, gene and protein expression of Osteoblast markers (*RUNX2* and *P1NP*) in IL-6R and IL-23R blocking experiments showed a significantly ($p<0.01$) positive correlation ($r^2=0.74$) with IL-17 production.

Conclusion: This study for the first time establishes that pathogenic Th17 cells produce IL-17 via IL-6R pathway in leprosy T1R reactions. Secondly, leprosy reactions and steroid treatment have enhanced levels of pathogenic/inflammatory Th17 cells and thus could lead to leprosy reaction mediated bone loss. The study has clinical implicationsn with respect to the management of bone health in leprosy disease conditions.

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RADIOFREQUENCY ECHOGRAPHIC MULTY SPECTROMETRY (REMS) FOR THE ASSESSMENT OF BONE FRAGILITY IN MASTOCYTOSIS

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Objective(s): Mastocytosis (MC) is a rare disease characterized by the abnormal accumulation of mastocyte, leading to a persistent allergic response and subsequent inflammation. One of the most commonly affected tissues is bone characterized by reduced bone mineral density (BMD), fragility fracture, and bone pain. Bone loss seems to primarily affect trabecular bone more than cortical one,[1] likely due to the direct colonization of mastocytes in the bone marrow. Therefore, the quality assessment of bone microarchitecture in patients affected by mastocytosis (MCp) is crucial.

This study aims to evaluate the impact of MC on the quality of bone microarchitecture by using the REMS-based Fragility Score (FS) parameter. The FS is an indicator of skeletal fragility independent of BMD, ranging from 0 to 100, where 100 indicates the maximum similarity to a fractured model, and 0 indicates the maximum similarity to a healthy model.

Material and Methods: A total of 35 MCp patients were enrolled and compared to a healthy control group (HC) matched for age and BMI. All patients underwent REMS scans of the proximal femur, and the difference in FS values between the 2 study groups was evaluated using a t-test.

Results: The mean REMS-FS was significantly higher in MCp patients (78.8 ± 6.7) than in the HC (38.1 ± 18.9) ($p<0.0001$). As shown in Figure 1, the FS accurately discriminates between the 2 groups.

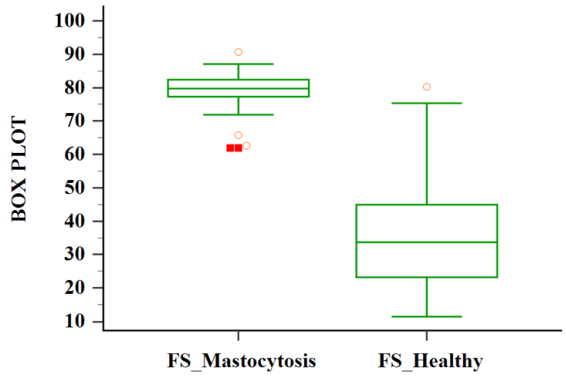

Figure 1

Conclusion(s): This study, as expected, shows a significant deterioration in bone quality in MCp patients. These findings highlight the importance of assessing bone microarchitecture quality in MCp through the REMS-based FS parameter.

References:

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P380

THE ASSOCIATIONS OF 10-YEAR INCIDENT VERTEBRAL AND NON-VERTEBRAL FRACTURES WITH MUSCLE PARAMETERS: INSIGHTS FROM THE OSTEOLAUS COHORT

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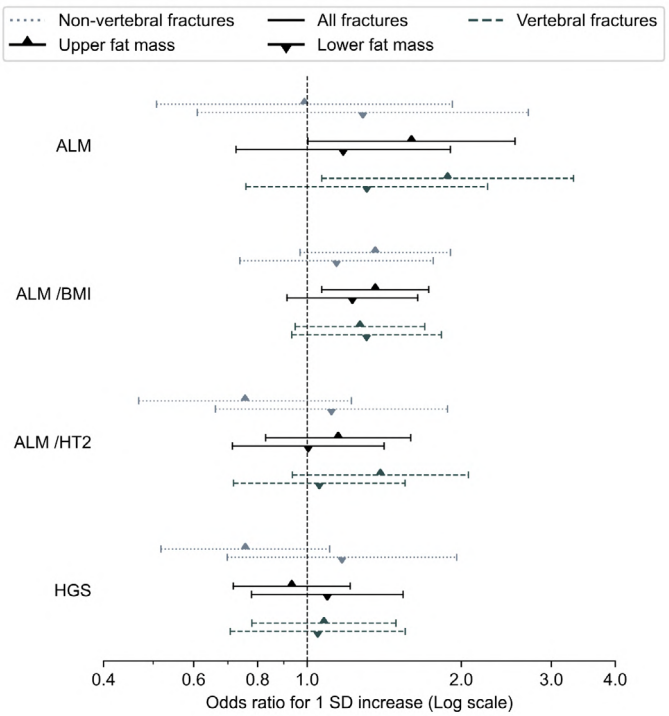
Objectives: Muscle parameters are associated with falls, fractures, and mortality, but the results vary across studies. We explored the associations of muscle strength and mass with 10 years incident vertebral and non-vertebral fractures.

Materials and methods: We followed 1475 postmenopausal women aged 50–80 years (OsteoLaus cohort, Lausanne, Switzerland) each 2.5 years for 10 years. Handgrip strength (HGS) was assessed with a Jamar dynamometer, and lean mass (LM) and appendicular LM (LMA) was assessed by DXA. Primary outcomes included hip, humerus and forearm low-trauma fractures identified via in-person interviews (non-vertebral fractures) and radiological vertebral fractures. For crossectional analysis baseline values were compared via two-sided t tests or Wilcoxon tests (Bonferroni adjustment: significative if $p<0.0028$). In the prospective study multivariate logistic regression models were used to retrieve the odds ratio (OR), 95% confidence interval (CI).

Results: After 10.2±0.4 years of follow-up, 944 women remained enrolled (age 73.0±6.9 years, BMI 25.7±4.8 kg/m^2, ALM 16.8±2.5 kg, HGS 21.2±5.5 kg), 260 of whom experienced fractures, including 174 vertebral and 107 non-vertebral fractures. Compared with nonfractured participants, participants with an incident fragility fracture had a 1.5 kg lower HGS at baseline but no significant difference in their ALM, ALM/height^2 or ALM/BMI. HGS was also not significant in the multivariate model. One SD increase in ALM (+2.58kg) or total body LM (+5.38kg) was associated with a 1.65 (CI:1.09–2.49) and 1.89 (CI:1.15–3.11) greater risk of vertebral fractures over 10 years, respectively, but not at shorter follow-up periods. There was no association with ALM/height^2 or ALM/BMI. No association was demonstrated for non-vertebral fractures. Further 2nd- and 3rd-order regressions did not provide a better visual fit. Baseline muscle parameters were not different for participant with or without incident fall or death.

Conclusions: Lean mass is an independent risk factor for incident vertebral fractures over 10 years but not for non-vertebral fractures. Mechanical and endocrine differences could explain this weight dependence in vertebral and non-vertebral fractures. Further studies are needed with greater sample sizes, other muscle assessment modalities, and considering the previous limitations.

Figure 1. Subgroup analysis by fracture type and fat mass median



P381

MACHINE LEARNING FOR THE PREDICTION OF FRAGILITY FRACTURES BY BONE AND BODY COMPOSITION PARAMETERS: FINDINGS FROM THE OSTEOLAUS 10 YEARS POPULATIONAL COHORT

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Objectives: Recent reviews highlighted the potential value of artificial intelligence in improving fragility fracture prediction. However, no studies have comprehensively integrated bone and body composition metrics from Dual X-ray Absorptiometry (DXA) in fracture prediction models. We aim to analyse the prediction of fragility fractures using regional and total body DXA assessments using a machine learning pipeline.

Material and methods: 1475 Swiss post-menopausal women (age 64.5±7.6years, body mass index 25.9±4.5kg/m^2) from the Osteo-Laus cohort were followed for 10 years (2010-2022). Parameters of bone health (hip and spine DXA: 34 variables) and body composition (Whole body DXA: 65 variables) were assessed by DXA scans. Vertebral fractures were screened with lateral DXA. Other risk factors (15 variables) and fragility fractures were collected from questionnaires. These parameters were tested separately or combined (114 variables) in different datasets. All datasets were split for training (85%) and testing (15%) with a balanced fragility fractures proportion. Models were trained using logistic regression, multilayer perceptron, random forest, and XGBoost, with hyperparameters optimized through grid search and 5-fold internal cross-validation, to maximize the area under the curve (AUC).

Results: 590 to 957 participants were included in the final complete case analyses, with 237 fragility fractures. Across all models and datasets, the training AUC values ranged from 0.69 to 1.0, while the test AUC values ranged from 0.55 to 0.78. The combination of bone, body composition and fracture risks parameters in the same dataset achieved the best test AUC (0.65-0.78). Logistic regression demonstrated the best balance between performance (AUC 0.78) and generalizability (specificity 0.66, recall 0.69). Other models showed varying trade-offs between overfitting and reduced test performance (eg. XGBoost: AUC 0.72, specificity 0.82, recall 0.25).

Conclusions: These findings emphasize the value of combining DXA-derived bone and body composition parameters for fragility fracture prediction in postmenopausal women. While logistic regression produced the most promising results in this preliminary study, the other models remain at interest for further analysis in combination with image based analysis. Further studies including a comparison with FRAX®, larger sample size and external validation are needed.

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TERIPARATIDE-ASSOCIATED OSTEOSARCOMA: A 20-YEAR RETROSPECTIVE STUDY USING REAL-WORLD DATA FROM THE EUDRAVIGILANCE DATABASE

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Objectives: Teriparatide is a recombinant human parathyroid hormone analog that stimulates osteoblastic activity, promoting new bone formation. It is used to treat osteoporosis and has demonstrated well-established clinical efficacy. However, concerns about a potential link between teriparatide and osteosarcoma, based on preclinical studies, have limited its broader application. We aim to evaluate osteosarcoma's occurrence as a suspected adverse event of teriparatide in a real-world pharmacovigilance database.

Material and Methods: This study employed the EudraVigilance public version database to collect suspected adverse reactions (SARs) of teriparatide, focusing on osteosarcoma cases, between January 2005 and December 2024. Only SARs reported by healthcare professionals were included. SARs possibly related to other drugs and duplicated cases were excluded. Data including age group, sex, therapeutic indication and outcome were retrieved from the public database. A descriptive analysis of the available data was performed.

Results: Over the study period, 16,614 reports of SARs related to teriparatide were submitted to the EudraVigilance database. Of these, 15 reports involved osteosarcoma, accounting for 0.09% of all teriparatide-associated SARs.

Most cases concerned patients from outside the European Economic Area (86.7%), and the majority were women (71.4%) aged between 65 and 85 years (60.0%). All patients with available treatment indication data were being treated for osteoporosis. Among patients experiencing these SARs, 5 (33.3%) are known to have had a fatal outcome. Every case was considered serious by the reporter. In four reports, osteosarcoma was reported alongside other neoplastic conditions, including one case each of lung cancer, urothelial carcinoma, ductal breast carcinoma, and chondrosarcoma.

Conclusions: Real-world data are valuable in identifying rare side effects, particularly in diverse patient populations. In our study, osteosarcoma is a rare adverse event associated with teriparatide, with a very low incidence in the EudraVigilance database. Given the small number of cases, it isn´t possible to establish a cause-effect relationship.

P383

PREVALENCE AND ASSOCIATED RISK FACTORS OF SARCO-OSTEOPOROSIS AMONG COMMUNITY-DWELLING OLDER ADULTS IN TAIWAN

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Objective:
Sarcopenia and osteoporosis are significant age-related conditions that share risk factors and pathophysiological mechanisms. Their co-occurrence, termed 'sarco-osteoporosis,' may lead to adverse health outcomes. This study aimed to determine the prevalence of sarco-osteoporosis and identify its associated risk factors among community-dwelling older adults in central Taiwan.

Materials and Methods:
We conducted a cross-sectional study of adults aged ≥65 years in Changhua County, Taiwan. Bone mineral density and whole-body appendicular muscle mass were measured using mobile dual-energy X-ray absorptiometry (DXA, Horizon, Hologic Inc). Muscle strength and physical performance were assessed via handgrip strength and 6-meter gait speed tests. Participants completed questionnaires covering medical history, the Study of Osteoporotic Fractures (SOF), and lifestyle habits including exercise. Osteoporosis was defined as a T-score ≤-2.5 in either lumbar spine or hip. Sarcopenia was defined according to the Asian Working Group for Sarcopenia (AWGS 2019) criteria. Age-standardized prevalence was calculated using the 2010 Taiwan population and housing census and 2001 WHO age standardization rates.

Results:
The study enrolled 163 community-dwelling older adults (80.4% female, mean age 75.5 years). Raw prevalence rates were 66.9% for osteoporosis, 22.1% for sarcopenia, and 16.6% for sarco-osteoporosis. Age-standardized prevalence rates per 100 persons weighted by Taiwan standard population were 63.8, 20.3, and 15.2 for osteoporosis, sarcopenia, and sarco-osteoporosis, respectively. When weighted by world standard population, the rates were 62.2, 19.0, and 14.3 per 100 persons. Multivariate logistic regression analysis identified four independent risk factors for sarco-osteoporosis: body mass index (OR 0.643, 95% CI 0.522-0.794), frailty (OR 5.083, 95% CI 1.177-21.948), hypertension (OR 3.932, 95% CI 1.312-11.788), and exercise habit (OR 0.306, 95% CI 0.106-0.882). The prediction model was defined as: Logit(p) = −0.847 + 0.009(Sex) + 0.031(Age) − 0.441(BMI) + 1.51(Frailty) + 1.31(Hypertension) − 1.213(Exercise).

Conclusions:
Sarco-osteoporosis is prevalent among older adults in Taiwan. Lower body mass index, frailty, and hypertension were associated with increased risk, while regular exercise was protective. These findings highlight the importance of risk factor modification and regular exercise in preventing sarco-osteoporosis.

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IS MULTILEVEL INTERVENTION MORE EFFECTIVE? AN ANALYSIS OF CALCIUM, VITAMIN D, EXERCISE, AND MEDICATION ON BONE MINERAL DENSITY

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Objective
Effective management of osteoporosis requires selecting appropriate intervention strategies based on the patient's condition. This study compared the changes in bone mineral density (BMD) of three patients under different intervention levels: no intervention, intervention with calcium, vitamin D, and exercise, and a multilevel intervention combining calcium, vitamin D, exercise, and medication. The results showed that the higher the level of intervention, the more significant the improvement in BMD, providing important reference for clinical treatment.

Methods

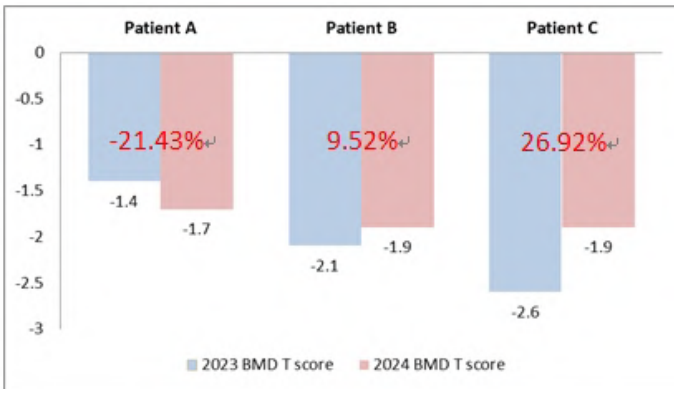
Research objects:
IPatient A: No intervention was performed and served as the control group.
IPatient B: Calcium, vitamin D supplementation and exercise intervention.
IPatient C: Calcium, vitamin D supplementation, exercise intervention and drug treatment.

Intervention content:

Patient A (control group)	INo specific intervention, no special adjustments to daily life.
Patient B (mid-level intervention)	IDaily calcium supplement (600mg) IDaily vitamin D supplement (800IU) IResistance or aerobic exercise three times a week
Patient C (Multilevel Intervention)	IThe same calcium and vitamin D intake and exercise regimen as patient B IAdd RANKL inhibitor drug (Denosumab, once every six months)

Assessment method:
IBone density measurement: using dual-energy X-ray absorptiometry (DXA).
IHealth status monitoring: including patient feedback, blood biochemical indicators and side effect records.
Observation period: 12 months after intervention.

Results



	2023 BMD T score	2024 BMD T score	Improvement
Patient A	-1.4	-1.7	-21.43%
Patient B	-2.1	-1.9	9.52%
Patient C	-2.6	-1.9	26.90%

Conclusion

This study found a close correlation between various interventions and the improvement in bone mineral density (BMD). The increase in intervention levels was positively correlated with improvements in BMD. Moderate-level interventions provide an efficient, low-side-effect treatment option. Multilevel interventions showed the best results and are suitable for patients at high fracture risk. Tailoring interventions based on patient characteristics is key to enhancing bone health.

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CALCIUM SUPPLEMENTATION AND THE RISK OF CARDIOVASCULAR EVENT RECURRENCE: A POPULATION-BASED STUDY

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Objectives: Calcium supplements are widely used, but their safety is questioned due to a potential link to cardiovascular risk. The impact of calcium supplements on individuals with major cardiovascular disease (CVD) remains unstudied. Objectives: To investigate the association between calcium supplementation and the risk of CVD recurrence and all-cause mortality in patients with prior CVD. Material and Methods: This retrospective population-based study used the territory-wide electronic health records in Hong Kong. Individuals ≥ 40 years old and newly diagnosed with CVD from 1 January 2006 to 31 December 2015. Those who died on the same day as the event or during the hospitalization of the event were excluded. The treatment group consisted of CVD patients prescribed calcium supplements, while the control group consisted of those who never prescribed calcium supplements from 1 January 2005 to 31 December 2020. CVD recurrence and all-cause mortality were the primary outcomes. Propensity score (PS) matching was adopted to balance the baseline characteristics of treatment and control groups, and the Cox proportional hazard model was used to estimate relative hazards. Results: The matched cohort included 17,720 CVD patients in each arm. Calcium supplementation is associated with an increased risk of recurrence of adverse CVD events (hazard ratio [HR], 1.10; 95% CI, 1.07-1.14) and a reduced risk of all-cause mortality (HR, 0.97; 95% CI, 0.94-1.00). However, heterogeneity exists in the associations. Calcium-only supplementation is associated with a greater risk of CVD recurrence (HR, 1.21; 95% CI, 1.17-1.25) compared to the combination of vitamin D (HR, 0.97; 95% CI, 0.93-1.01), and with a more pronounced association noted in males (HR, 1.15; 95% CI, 1.09-1.20) than females (HR, 1.07; 95% CI, 1.03-1.11). Conclusions: In patients with major CVD, calcium supplementation is linked to an increased risk of CVD recurrence. Caution should be exercised when prescribing or using calcium supplements among patients with CVD, especially for males. The combination of calcium and vitamin D supplementation may pose fewer concerns than calcium-only supplementation.

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ANALYSIS OF OSTEOPOROSIS AND MORTALITY RISK IN VETERANS ACROSS DIFFERENT MILITARY RANKS

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Objective

This study aimed to investigate the relationship between military ranks and osteoporosis, as well as the associated mortality risk among veterans. The study also explored whether osteoporosis acts as a mediating factor in mortality risk within this population.

Methods

A retrospective study was conducted on 1,423 veterans who underwent their first dual-energy X-ray absorptiometry (DXA) scan at Taichung Veterans General Hospital between January 2010 and December 2022. The participants were categorized into three military ranks: enlisted (n=154), non-commissioned officers (n=481), and commissioned officers (n=788). Statistical analyses, including Kruskal-Wallis tests and Chi-square tests, were performed to compare demographic characteristics, bone mineral density (BMD), and comorbidities among ranks. Cox regression models were applied to evaluate the association between military rank, osteoporosis, and mortality risk, with subgroup analyses by age, bone status, and comorbidities.

Results

Higher military ranks were associated with lower bone mineral density (BMD) and a greater prevalence of osteoporosis. Commissioned officers had the highest prevalence of osteoporosis (54.5%), compared to non-commissioned officers (27.4%) and enlisted personnel (13.8%) ($p<0.001$). Chronic kidney disease (CKD) and chronic heart failure (CHF), significant predictors of mortality,

were more prevalent in higher-ranking groups (p<0.01). Cox regression analysis indicated that osteoporosis independently increased the risk of mortality (HR=1.60, 95%CI: 1.21-2.11, p<0.01). Subgroup analysis showed that commissioned officers aged ≥81 years had a significantly higher mortality risk (HR=2.29, p<0.001). After adjusting for confounders, military rank itself was not an independent predictor of mortality.

Conclusion

Commissioned officers exhibited a higher burden of osteoporosis and comorbidities, which significantly contributed to increased mortality risk. The findings highlight the importance of early osteoporosis screening and integrated management of comorbidities, particularly for high-ranking veterans, to reduce mortality risk.

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REDUCING FALL AND FRACTURE RISK THROUGH TARGETED OSTEOPOROSIS CARE AMONG COMMUNITY-DWELLING OLDER ADULTS:- SECONDARY ANALYSES OF A RANDOMIZED CONTROLLED TRIAL

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Objective

To evaluate the effectiveness of osteoporosis care in reducing the risk of falls and fractures among community-dwelling older adults.

Methods

This secondary analysis of a cluster randomized trial was conducted in rural communities in Taiwan. Participants aged 50 years or older were assigned by community level to either the osteoporosis care (OC) group or the usual care (UC) group. The OC intervention focused on osteoporosis screening and treatment. Participants in the OC group with a FRAX major osteoporotic risk >20% or FRAX hip fracture risk >3% were considered at high fracture risk and recommended for anti-osteoporotic medication (AOM). The study followed participants for two years, with primary outcomes being fall and fracture incidence. A multivariable Cox proportional hazards model assessed the risk of these outcomes between groups, adjusting for confounders.

Results

A total of 188 participants (aged 75.6 ± 8.7 years) in the UC group and 201 participants (aged 74.4 ± 8.6 years) in the OC group were included. Osteoporosis and sarcopenia prevalence did not differ between groups, but the OC group had significantly higher education levels and urbanization rates (p < 0.05). In the OC group, 73.6% (n=148) were at high fracture risk, and 50.7% (n=102) received AOM. After adjusting for urbanization and FRAX scores, the hazard ratio for falls was slightly lower in the OC group (1 vs. 0.8, 95% CI: 0.6–1.1, p = 0.198), while the adjusted hazard ratio (aHR) for fractures was significantly reduced (aHR: 0.3, 95% CI: 0.1–0.8, p = 0.011).

Conclusion

This study demonstrated that osteoporosis care may reduce the risk of fractures in community-dwelling older adults. Although the fall incidence was lower, the difference was not statistically significant. These findings suggest that targeted osteoporosis care could be an effective intervention for fracture prevention in community settings.

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A HOMOZYGOUS SP7/OSX MUTATION CAUSES OSTEOGENESIS AND DENTINOGENESIS IMPERFECTA WITH CRANIOFACIAL ANOMALIES

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Osteogenesis imperfecta (OI) is a heterogeneous spectrum of hereditary genetic disorders that cause bone fragility, through various quantitative and qualitative defects of type 1 collagen, a triple helix composed of two α1 and one α2 chains encoded by *COL1A1* and *COL1A2*, respectively. The main extra-skeletal manifestations of OI include blue sclerae, opalescent teeth, and hearing impairment. Moreover, multiple genes involved in osteoblast maturation and type 1 collagen biosynthesis are now known to cause recessive forms of OI. In this study a multiplex consanguineous family of two affected males with OI was recruited for genetic screening. To determine the causative, pathogenic variant(s), genomic DNA from two affected family members were analyzed using whole exome sequencing, autozygosity mapping, and then validated with Sanger sequencing. The analysis led to the mapping of a homozygous variant previously reported in SP7/OSX, a gene encoding for Osterix, a transcription factor that activates a repertoire of genes involved in osteoblast and osteocyte differentiation and function. The identified variant (c.946C > T; p.Arg316Cys) in exon 2 of *SP7/OSX* results in a pathogenic amino acid change in two affected male siblings and develops OI, dentinogenesis imperfecta, and craniofacial anomaly. On the basis of the findings of the present study, *SP7/OSX*:c.946C > T is a rare homozygous variant causing OI with extra-skeletal features in inbred Arab populations (Al-Mutairi *et al.*, 2024).

Reference:

Al-Mutairi, D.A., Jarragh, A.A., Alsabah, B.H., Wein, M.N., Mohammed, W. & Alkharafi, L. (2024) A homozygous SP7/OSX mutation causes osteogenesis and dentinogenesis imperfecta with craniofacial anomalies. *JBMR Plus*, **8**, ziae026.

P389

ASSESSMENT OF THE RISK FACTORS FOR OSTEOPOROSIS AND OSTEOPOROTIC FRACTURES IN PSORIATIC ARTHRITIS PATIENTS WITH DISEASE-MODIFYING ANTIRHEUMATIC THERAPY

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Objectives: The aim of our study was to assess the risk factors for osteoporosis and osteoporotic fractures in patients with anti-Tumor Necrosis Factor (TNF) therapy and Conventional Synthetic Disease-Modifying Antirheumatic Drugs (csDMARDs).
Materials and Methods: We conducted a retrospective study at Central Military Emergency University Hospital "Dr. Carol Davila". Medical records spanning from March 2023 to November 2024 were reviewed, resulting in the inclusion of 92 patients. The study group included 52 patients with psoriatic arthritis - PsA (that met Classification Criteria for Psoriatic Arthritis – CASPAR) on anti-TNF therapy - 32 patients, Methotrexate - 12 patients and Leflunomide - 8 patients. The control group included 40 age and sex-matched patients. All patients underwent evaluation using hip and lumbar Dual-Energy X-Ray Absorptiometry (DXA) - Bone Mass Density - (BMD), T-score, Fracture Risk Assessment Tool (FRAX) score, Disease Activity in Psoriatic Arthritis (DAPSA) and evaluation for risk factors (25-OH Vitamin D, Homocysteine - Hcy, hemoglobin levels, smoking status, body mass index - BMI) at an interval of 12 months.
Results: In the control group, we observed that 15% of them had osteoporosis and 27.5% had osteopenia. In the PsA group, we observed that 19.2% had osteoporosis and 32.7% had osteopenia. Only 5.8% had osteoporotic fractures -3.8% vertebral fractures and 1.9% femoral neck fractures. T-score was significantly lower in menopausal females that had scalp psoriatic lesions. FRAX score was correlated with high level of Hcy (p=0.0002) as well as with low 25-OH Vitamin D levels (p=0.0001) and chronic anemia (p=0.001). Low T-scores were correlated with high Hcy levels (p=0.0002) and low 25-OH Vitamin D levels (p=0.0003). Low BMI and high levels of Hcy were correlated with a greater risk of osteoporosis. Active disease was correlated with low T-score (p=0.0001). After 12 months, patients treated with anti-TNF treatment had an increase in T-score compared to csDMARDs treated patients.
Conclusion: FRAX scores were higher in PsA patients than controls. Hyperhomocysteinemia, chronic anemia and 25-OH Vitamin D deficiency were associated with higher osteoporosis risk and FRAX scores in PsA patients. Anti-TNF therapies were associated with improved BMD and FRAX scores after 12 months.

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CLINICAL AND BIOCHEMICAL CHARACTERIZATION OF PAGET'S DISEASE OF BONE: INSIGHTS INTO PHENOTYPES AND TREATMENT OUTCOMES

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Objectives: To characterize a cohort of Paget's disease of bone (PDB) patients and assess phenotypic differences and treatment effects.
Methods: Retrospective analysis of patients treated in the last 5 years in our Rheumatology department. Socio-demographic, disease and treatment related data were collected. Descriptive and comparative analysis used the means, T-tests and Mann-Whitney U Tests.
Results: 13 patients were included in this analysis, of whom 9 (69.20%) were male. Mean age at diagnosis was 76.38 ± 8.65 years. Nine (69.20%) patients had monostotic disease. Polyostotic disease involved between 2 and 6 bones. Three (23.10%) patients had a prior fragility fracture at first evaluation.
Sacrum was the most affected site, in 5 (38.46%) patients.
Six (46.20%) patients were referred to our clinic due to incidental findings on computed tomography scans.
Baseline alkaline phosphatase (AP) mean levels were 189.69±151,20 U/L, with no significant differences between genders (p=0.825), PDB type (p=0.825) or the presence of pain (p=0.769).
Twelve (92.30%) patients were treated with a single dose of zoledronate infusion. In this group, AP levels after treatment were significantly reduced compared to baseline (p=0,003). No patients reported adverse effects.
Conclusions: This work highlights the clinical profile of PDB patients, a rare osteometabolic disease. In our sample, patients were mostly male, with monostotic and sacral involvement, as described in the literature[1]. AP levels at baseline are similar across demographic and clinical characteristics, suggesting that these factors do not influence biochemical activity. Lastly, it reinforces zoledronate therapy as a safe and effective therapy, by significantly reducing AP levels while being safely tolerated in all patient subgroups.
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P391

SEVERE OSTEOPOROSIS WITH FRACTURES AS THE INITIAL MANIFESTATION OF AXIAL SPONDYLARTHRITIS: A DIAGNOSTIC CHALLENGE

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Introduction: In spondylarthritis (axSpA), chronic inflammation disrupts bone metabolism, leading to both new bone formation and bone loss in the spine. In axSpA, osteoporosis (OP) and fractures are a common occurrence. We report a case where OP preceded the diagnosis of axSpA.

Case report: A 45-year-old male was referred to our Osteoporosis department after a compression fracture of the 10th thoracic vertebra, presenting as mechanical back pain. He denied significant trauma. He had a personal history of obesity and a left femoral neck insufficiency fracture from transient hip OP one year earlier. He described a 4-year history of inflammatory back pain and bilateral tibiotarsalgy. Aside from daily smoking and alcohol use, no other risk factors for OP were identified. Dual-energy X-ray absorptiometry showed femoral neck and lumbar T-scores of -2.6SD, -3.4SD, respectively, and Z-scores of -2.7SD, -4.0SD, respectively. Spinal X-rays revealed three vertebrae planae, with no other findings. Blood work including hormonal study was normal. During follow-up, he reported spontaneous fractures of costal arches and the 5th right metatarsus.

Suspecting axSpA, sacroiliac joints nuclear magnetic resonance showed bone marrow edema in the left sacral aspect of the joint. Having excluded other causes for 2nd OP, it was assumed a diagnosis of fracturary OP secondary to axSpA. Zoledronate was started, and lacking response to 2 NSAIDs, adalimumab therapy was proposed.

Conclusion: This case shows OP preceding axSpA diagnosis, contrary to the typical temporal sequence seen in clinical practice. More, the patient's notably low lumbar T-score contrasts with axSpA expected new bone formation. These atypical findings underscore the value of considering axSpA in patients presenting initially with OP, especially when features like inflammatory back pain are present. Early treatment is crucial to improve bone prognosis.

P392

PREDICTIVE FACTORS FOR THE DELAY BEFORE THE FIRST CONSULTATION IN PEDIATRIC RHEUMATOLOGY DEPARTMENT FOR CHILDREN WITH JUVENILE IDIOPATHIC ARTHRITIS

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Introduction Although it is the most common form of chronic arthritis in children, Juvenile idiopathic arthritis (JIA) remains poorly known by primary care physicians. This lack of awareness can lead to diagnostic delays, which may alter the appropriate management during the early stages.

Objective The study aimed to analyze the duration between the onset of symptoms and the first pediatric rheumatology (PR) consultation and to identify predictive factors influencing this delay.

Methodology This retrospective longitudinal study included patients diagnosed with JIA based on ILAR 2001 criteria and followed in a PR department. Data were collected on care pathways, symptom onset, and clinical, biological, and radiological findings from the first pediatric rheumatologist evaluation. The duration between symptom onset and the first PR consultation was recorded, and factors affecting this delay were analyzed.

Results The study included 56 children with a mean age of 15 +/- years. The mean age at symptom onset was 10 +/- 4.1 years, and the sex ratio was 1. The most common JIA subtype was enthesitis-related arthritis (ERA) (40%). The median delay before the first PR consultation was 10 +/- months. Pain was the most frequently reported initial symptom (70%). On average, three physicians were consulted before the first pediatric rheumatologist examination. General practitioners were the first consulted in 36% of cases, but pediatric orthopedists were the most frequent referrers to PR (51%).Significant associations were found between the delay before the first PR consultation and the number of physicians consulted ($p = 0.022$) , the number of swollen joints ($p = 0.042$) and limping as the initial symptom ($p = 0.023$).No significant association was noted with the number of painful joints ($p = 0.59$) , the age at symptom onset ($p = 0.335$) ,symptoms such as fever ($p = 0.465$), pain ($p = 0.693$), or enthesitis ($p = 0.496$).The longest delays were observed in cases of ERA ($p = 0.001$). There was no significant association between the delay and sex ($p = 0.83$). Neither the involvement of an orthopedist nor an emergency physician as the first consulted professional was associated with a longer delay. Despite pediatric orthopedists being the most frequent referrers to PR, their involvement as the initial point of care was not linked to shorter delays ($p = 0.219$).

Conclusion The delay to the first PR consultation in this series was longer compared to other countries. Improved awareness of JIA is essential for earlier diagnosis and to prevent subsequent Complications.

P393

CLINICAL EFFICACY AND PROGNOSTIC FACTORS IN SHOCKWAVE THERAPY FOR PAINFUL SOFT TISSUE CONDITIONS: A REAL LIFE EXPERIENCE

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Introduction: Extracorporeal Shockwave Therapy (ESWT) is a non-invasive treatment for chronic soft tissue injuries. Despite its growing use, the efficacy of focused shockwave therapy (FSWT) varies, necessitating further investigation into its clinical effectiveness and the factors influencing outcomes. The aim of this study was to determine the clinical efficacy and influencing factors in a real life situation.
Materials and MEthods: A retrospective cohort study analyzed medial records of 116 patients with chronic soft tissue pain treated with FSWT at a tertiary hospital between July 2021 and August 2023. Inclusion criteria included patients over 18 with pain lasting more than 3 months.
Data on demographics, clinical characteristics, and treatment outcomes were extracted and analysed using descriptive statistics, analysis of variance and multivariate regression.
Results: The average Visual Analog Scale (VAS) improvement was 38.5%. There was no significant difference in improvement between gender or different pathologies. Prior corticosteroid infiltrations showed less improvement (30%) compared to those without (48%) p<0.005 Multivariate analysis identified previous infiltration as a key factor negatively affecting VAS improvement.
Conclusion: FSWT is an effective alternative for reducing pain in chronic soft tissue conditions, though its effectiveness is lower in patients with prior corticosteroid infiltrations. Further studies are needed to refine treatment protocols and understand the varying responses among different patient groups.
Key words: Focal shockwave therapy, FSWT, tendinopathies, rehabilitation.

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ABALOPARATIDE IN OSTEOPOROSIS: A DESCRIPTIVE STUDY FROM A SPANISH MULTICENTER COHORT

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Background:
Abaloparatide (ABL) is a novel synthetic analog of human parathyroid hormone that recently has been approved in Spain for the treatment of osteoporosis in patients at high risk of fractures.
Objectives:
To describe the clinical features of a cohort of spanish patients with osteoporosis who initiate treatment with ABL.
Methods:
A retrospective multicentre descriptive study was conducted between May 2024 and January 2025 on patients treated with ABL in 3 hospitals in eastern Spain. Statistical analysis was performed with SPSS version 21.0.
Results:
A total of 58 patients were included in the study, with a median age of 67.5 years [IQR 61.25–74]. 79.3% had at least one previous fracture, with vertebral fractures being the most frequent (60.71%), followed by wrist (10.71%) and hip (8.93%). Among previous treatments, the most frequent were oral bisphosphonates (31%) and denosumab (19.34%). Some patients were treated with teriparatide with a median time of 11.5 months [IQR 5.25-17.75]. Densitometry showed a mean T-score in the lumbar spine of -2.90 ± 1.24 SD, in the femoral neck of -2.64 ± 1.01 SD, and in the total hip of -2.70 ± 1.21 SD. 32 patients (55.17%) received the treatment as a first-line therapy while 22 patients (37.93%) as a second line. During follow-up there were 5 discontinuations: 4 were due to non-severe adverse effects and 1 was due to the patient's own decision. No fractures were recorded during the follow-up period.
Conclusion:
This multicentre cohort study shows a predominance of abaloparatide use in spinal osteoporosis, used as first and second-line treatment. No fractures were recorded during follow-up, and discontinuations were mostly related to mild adverse effects. These results support the role of abaloparatide in the treatment of patients with high fracture risk and previous therapeutic difficulties.
Disclosure of interest: None declared

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ASSOCIATION BETWEEN BETA BLOCKER USE, BONE MINERAL DENSITY, AND BONE TURNOVER: INSIGHTS FROM A LARGE CROSS-SECTIONAL STUDY OF OLDER ADULTS

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Objective Beta blockers are widely prescribed in older adults and exert their effects by inhibiting the adrenergic system, which is known to stimulate bone resorption and suppress bone formation. There is some research to suggest that beta blockers may positively influence bone health by increasing bone mineral density (BMD) and reducing fracture risk. This study aims to expand on this evidence base.

Material and Methods Study participants were from the Trinity Ulster University Department of Agriculture (TUDA) study, a large cross-sectional cohort of adults aged >60 years. Participants on osteoporosis treatments were excluded. BMD, measured by densitometry at the femoral neck, total hip, and lumbar spine, was compared between beta blocker users and non-users. Least squares mean BMD values were adjusted for age, sex, body mass index, physical performance status, vitamin D level, parathyroid hormone, renal function, comorbidities, lifestyle factors, glucocorticoid exposure, and medications known to affect bone health. Bone turnover markers (BTMs), including bone alkaline phosphatase (BAP) and tartrate-resistant acid phosphatase 5b (TRAP5b), were analysed in a subsample.
Results The study included 2,218 participants with a mean age of 70.1±6.5 years; 58.3% were female, and 29.0% (n=644) were beta blocker users. Beta blocker users exhibited significantly higher BMD at the femoral neck (0.867 vs. 0.853 g/cm², p=0.017) and lumbar spine (1.119 vs. 1.096 g/cm², p=0.015) in fully adjusted models, with a trend toward significance at the total hip (p=0.073). In subsample analysis (n=1,639), beta blocker users demonstrated significantly lower levels of BTMs: BAP (16.4 vs. 17.4 µg/L, p=0.005) and TRAP5b (2.98 vs. 3.15 µg/L, p<0.001).
Conclusions This study supports the association between beta blocker use and improved bone health in older adults, as evidenced by higher BMD and lower BTMs. The observed reduction in BTMs provides new insights into potential mechanisms underpinning these effects. However, these findings are limited by the cross-sectional of this study, and robust longitudinal studies and randomized controlled trials are needed to confirm these observations and better understand this potential relationship.

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TERIPARATIDE USE IN A BONE HEALTH CLINIC – AN IRISH EXPERIENCE.

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Objective: Teriparatide is the first osteoanabolic used for the treatment of patients with osteoporosis at high risk of fracture and became available in 2002. Guidelines for use vary by country with key criteria including lumbar spine T-score and presence of vertebral fracture(s). We aimed to explore the characteristics of patients treated with teriparatide in adults attending an Irish bone health clinic between 2002 and 2020.
Material and methods: We explored our Bone Health Clinic database to identify patients started on treatment with teriparatide during the period (2002 – 2020). Patient characteristics including age, sex and presence of vertebral fracture(s) were recorded. Predictors of teriparatide treatment versus other therapies was explored in multinomial regression.
Results: We identified 992 patients who were treated with teriparatide, 90% female, median age 69.6 years (IQR 60.9 – 70.1). The median lumbar spine T-score was -3.5 (IQR -2.6 to -4.1). The oldest patient was aged 94.5 years, and the lowest lumbar spine T-score was -7.0. Approximately, half (49.5%) had vertebral fracture(s) and of those 20.3% had osteopenia in the lumbar spine. Compared to other patients (n=5450) those prescribed teriparatide were more likely to have a vertebral fracture(s) (OR 2.26, CI 2.18 – 3.13, p<0.001), have lower spine T-scores (p<0.001), be female (OR 2.13, CI 1.59 – 2.84, p<0.001) and be of a younger age (p<0.0010).
Discussion: Teriparatide use as expected was predicted by history of vertebral fracture(s) and and was also independent of lower lumbar spine T-scores. Indeed, a significant proportion of patients with vertebral fracture(s) on teriparatide had osteopenia in the spine. Overall, about half of patients had T-scores below -3.5 in the lumbar spine. Lower usage in older patients may be due to frailty and factors related to teriparatide administration. The greater proportion of female users may be accounted for by their higher diagnosis rate of osteoporosis compared to males.

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HIGH PREVALENCE OF LOW 24-HOUR URINARY CALCIUM IN PATIENTS AT A BONE HEALTH CLINIC: PREDICTIVE OF SECONDARY HYPERPARATHYROIDISM AND LOWER HIP BONE MINERAL DENSITY.

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Objective: Low urinary calcium (hypocalciuria) can indicate poor dietary calcium intake. We aimed to evaluate the prevalence of low 24-hour urinary calcium in patients attending our bone health clinic. Furthermore, we sought to explore the relationship between hypocalciuria and secondary hyperparathyroidism (SHPT) and bone mineral density (BMD).
Material and methods: We identified patients who had routine 24-hour urinary calcium levels measured as part of a normal screen at our bone health clinic. Exclusion criteria was hypercalcaemia (serum calcium > 2.50 mmol). The prevalence of hypocalciuria (urinary calcium < 2.5 mol) and its relationship with SHPT (serum PTH > 65pg/ml) and hip BMD was explored in multinomial regression adjusting for relevant covariates.
Results: There were 1778 patients, 70% female, mean age 69.9 years with 30.8% having hypocalciuria. In a subsample where all covariate data was available (n = 1200), predictors of hypocalciuria were lower serum vitamin D (p<0.001) and higher eGFR (p<0.001). Hypocalciuria versus normal urinary calcium predicted SHPT (OR 2.57, CI 1.50 – 4.43, p<0.001) and lower hip BMD (p=0.004) after adjusting for age, sex, eGFR, BMI and serum vitamin D.
Conclusion: A high proportion (one third) had hypocalciuria likely reflecting poor dietary calcium intake. Consistent with this, hypocalciuria more than doubled the risk of SHPT independent of

serum vitamin D, eGFR and BMI and was associated with lower hip BMD. A limitation is that we could not account for the use of thiazide or loop diuretics which impact urinary calcium. Findings suggest that calcium intake is inadequate in a high proportion of patients attending a specialist bone health clinic.

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CLINICAL FEATURES OF OSTEOPOROSIS IN TYPE 1 AND TYPE 2 DIABETIC PATIENTS IN TÜRKIYE: A LARGE SCALE, NATIONWIDE STUDY

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Aim:Diabetes patients are at a significantly higher risk of fracture than the general population. The incidence of fragility fractures in diabetic people has significantly risen globally, along with increased life expectancy. Bone mineral density (BMD) decreases in type 1 diabetes. Type 2 diabetes raises the risk of fracture even in people with normal to high bone mineral density.Enhanced fracture risk in diabetes due to disease length, poor glucose control, vascular problems, and medications. This study examines osteoporosis frequency and causes in a large, nationwide population with type 1 and type 2 diabetes in Türkiye.
Methods: This retrospective population-based cohort study utilized the national electronic database of the Turkish Ministry of Health. Diabetic patients were enrolled from January 2015 to December 2021. Osteoporosis has been identified with ICD codes M80 and M81 within the diabetic population.
Results: The national diabetes cohort consisted of 82,050 patients (44.3±19.1 years, F/M: 45.5/54.5%) with type 1 diabetes and 7,050,118 patients with type 2 diabetes (59.1±13.4 yrs, F/M: 60.2/39.8%). Osteoporosis was observed in 10% (n: 8,575) of type 1 diabetics and 19.2% (n: 1,352,609) of type 2 diabetics.Osteoporosis was observed more frequently in type 1 (15.5%) and type 2 diabetic women (27.8%) compared to type 1 (6.2%) and type 2 diabetic men (6.1%). Osteoporosis frequency increases with age both type 1 and type 2 diabetes groups. The fracture rate is higher in type 1 diabetes (0.92%) than in type 2 diabetes (0.55%).
Type 1 diabetic patients with osteoporosis compared to type 2 diabetic patients have higher rates of coronary artery disease (63.4% vs. 54.5%), stroke (8.7% vs. 5.7%), peripheral artery disease (21.8% vs. 11.3%), heart failure (29.4% vs 15.3%), chronic renal disease (53.7% vs. 24.7%), retinopathy (14.1% vs. 3.6%), and neuropathy (45.7% vs. 34.3%).
The prevalence of osteoporosis rises in individuals with both type 1 and type 2 diabetes who have lower estimated glomerular filtration rates (eGFR). Bisphosphonate therapy is administered to 4.7% of individuals diagnosed with type 1 diabetes and osteoporosis and 6% of individuals diagnosed with type 2 diabetes and osteoporosis. 1.5% of patients with type 1 DM and 1.2% of individuals with type 2 DM were prescribed Denosumab. Cholecalciferol replacement therapy was administered to 32% of individuals diagnosed with type 1 diabetes and 40.1% of individuals diagnosed with type 2 diabetes with osteoporosis.
Conclusions: Osteoporosis was observed in 10% of type 1 diabetics and 19.2% of type 2 diabetic patients in a cohort from Turkiye. Osteoporosis frequency is more common in type 2 diabetes and increases with age. However, macrovascular and microvascular complications are more common in osteoporotic patients with type 1 diabetes than osteoporotic type 2 diabetic patients. There is a limited number of patients who are undergoing pharmacological intervention.

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BALANCE IMPROVEMENT AND FALL RISK REDUCTION IN GERIATRIC OSTEOARTHRITIS: A STUDY OF OTAGO AND SQUARE STEPPING EXERCISES

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Body
Osteoarthritis (OA) is a chronic degenerative joint disease that leads to disability. The prevalence of symptomatic knee OA is approximately 22% to 39% in India, which causes significant morbidity and impairment in elderly individuals.
Objective:
To study the effects of Otago exercise versus squarestepping exercises (SSEs) on balance, fall, and functional activities in geriatric individuals with OA knee
Methods:
A study was carried out at Pune among 40 geriatric individuals with age over 65 years. The individuals were assigned at random to the Otago exercise group or SSE. Both groups performed exercises for 40–45 min for 10 days. The primary outcome was balance, which was measured by the Berg Balance Scale and Limits of Stability test. The secondary outcomes were risk of fall, mea-

sured by the Morse fall scale and functional activity, measured by the Western Ontario and McMaster Universities Arthritis Index (WOMAC) scale.
Results:
Both the groups showed significant differences post intervention within the groups ($P < 0.05$). Betweengroup analysis showed that the Otago exercise group showed a higher mean difference in the primary outcomes that is in the Berg Balance Scale (19.25 > 15.24) and limits of stability. The SSE group showed a higher mean difference in Morse fall scale (18.81 > 8.8) and WOMAC scale (18.81 > 8.8).
Conclusion(s):
The study concluded that, in older patients with OA knee, Otago exercise is more successful at enhancing balance but SSE is more effective at enhancing fall risk and functional activity.
Implications:
Between group analysis of Berg balance and balance master parameters was statistically significant. The result of the study provides evidence that Otago exercise is more effective than the SSE on balance and the SSE is also effective on the risk of fall and functional activity.

P400

"IMPROVING OUTCOMES IN KNEE OSTEOARTHRITIS THROUGH TASK-SPECIFIC TRAINING"

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Body: Task-specific training improves functional performance in older adults requiring assistance with activities of daily living (ADLs) as well as community-dwelling older adult. While this approach seems appropriate for individuals with chronic knee pain, there is a lack of evidence regarding the effects of task-specific training to improve performance or general function in this population.
Objective: This study explores the role of task-specific training for individuals with knee osteoarthritis (KOA), with respect to pain and Physical functions to improve efficacy of performing ADLs and knee related Quality of Life (QOL).
Methods: A study was carried out at Pune among 40 geriatric individuals with age over 65 years. The individuals were assigned at random to the Otago exercise group or SSE. Both groups performed exercises for 40–45 min for 10 days. The primary outcome was balance, which was measured by the Berg Balance Scale and Limits of Stability test. The secondary outcomes were risk of fall, measured by the Morse fall scale and functional activity, measured by the Western Ontario and McMaster Universities Arthritis Index (WOMAC) scale.
Results: There was significant improvement ($p<0.001$) seen in all outcome measures. NPRS reduced from 5.9±1.7 to 3.4±1.8, 30-SCRT repetitions increased from 9.06±3.4 to 12.76±3.82, TSCT seconds reduced from 27.06±7.38 to 20.76±6.38, FTT seconds reduced from 12.03±4.23 to 9.43±3.73. In KOOS, ADL score improved from 30.13±9.86 to 14.50±7.92 and QOL score improved from 9.4±3.03 to 4.5±1.9 after 8 treatment sessions of functional training.
Conclusion(s): Task-specific training program is effective in reducing pain, improving performance and functional ability and quality of life in patients with KOA.
Clinical Implications: Many patients reported clinically improvement in stair climbing with increased speed and less assistance, floor transfer with reduced discomfort and minimal assistance. It is possible that the alternative techniques allow the patients to negotiate with less pain.

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SHORT-TERM FRACTURE RISK AND THE UTILITY OF FRAX®: INSIGHTS FROM THE DXA HIP COHORT

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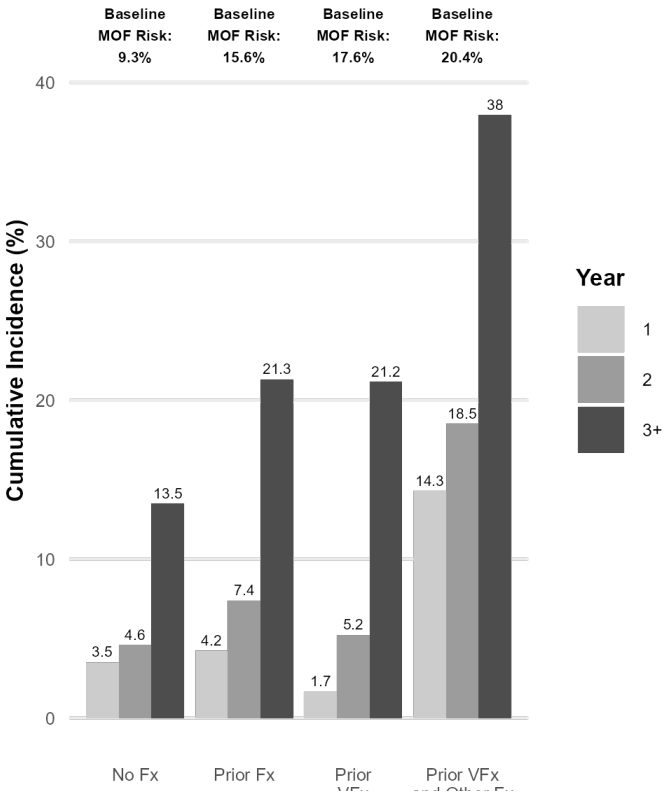
Objective
FRAX® significantly underestimates fracture risk in high-risk populations, particularly those with prior fractures (Fx). Short-term risk may be more clinically meaningful for these people. We compared FRAX® Major Osteoporotic Fracture (MOF) risk with incident Fx among adults with and without prior Fx.
Material and Methods
Data from a previously published subgroup of the DXA HIP cohort who all had baseline DXA and VFA imaging and follow-up to end of 2024 were analysed. Subjects were stratified into four groups based on fracture history: No Fx, Prior Fx, Prior Vertebral Fracture (VFx), and Prior VFx + Other Fx. Baseline FRAX® MOF scores were recorded. Cohort details and ethical approval are previously published. Cumulative MOF incidence was calculated over 1, 2, and ≥3 years after baseline scans
Results
1,261 subjects had baseline scans and follow-up data available: 77% female, median age: 69 years (IQR: 62, 76), median follow-up duration: 2.8 years (IQR: 2.04, 3.32). 49% had prior Fx, including 12% with Vertebral Fx; 35% were taking osteoporosis medication (93% anti-resorptive). Baseline MOF risk was 9.3%, 15.6%, 17.6%, and 20.4% for the 'No Fx', 'Prior Fx', 'Prior VFx', and 'Prior VFx + Other Fx' groups, respectively. Cumulative Fx incidence rose incrementally during follow-up among all groups (see figure). Cumulative fracture incidence exceeded baseline MOF for all 4 groups by study end, in particular for those with Prior VFx and other Fx (figure).
Conclusion
Short-term fracture risk is particularly high among patients with multiple prior fractures. This highlights the need for tools which address short-term fracture risk for those at very high risk. While

FRAX® estimates 10-year fracture risk in patients at low risk or without fractures, FRAX® MOF score underestimated fracture risk in our very high-risk cohort.

Cumulative Fracture Incidence (%) by Group

Year 3+ includes cumulative incidence for Years 3, 4, and 5



P402

IMPACT OF A FRACTURE LIAISON SERVICE ON MORTALITY AND SECOND FRACTURE RATES: FIVE-YEAR RESULTS IN ELDERLY HIP FRACTURE PATIENTS

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Objectives:
Hip fractures in the elderly are associated with high mortality and second fracture rates. We aimed to evaluate the impact of a Fracture Liaison Service (FLS) implementation on survival, complications, second fracture and mortality rates over five years.
Material and Methods:
We conducted a prospective cohort study including patients over 60 years old who sustained a hip fracture before and after the implementation of the FLS in our center (between January 2016 and December 2019). Patients were followed for five years after the index date and outcomes included mortality, second fracture rates, adherence to osteoporosis treatment (Proportion of Days Covered, PDC), and complications. A Multivariate Cox proportional hazard model was used to compare the two groups, adjusting for confounders such as age, ASA score, and fracture type.
Results:
A total of 1401 patients were included in this study (355 before FLS implementation and 1046 after FLS implementation). Anti-osteoporotic drugs were more frequently prescribed after FLS implementation (77.5% vs 12.1%; p<0.01). Adherence to anti-osteoporotic treatment significantly increased (48.9% vs 30.2%; p<0.01), and second fracture rates were significantly lower in adherent patients (10.8% vs 19.1%; p<0.01). A total of 618 (59.1%) patients after FLS implementation and 194 (54.6%) individuals before (p=0.17) died during the five-years follow-up period. Patients after the implementation of the FLS protocol had a lower all cause one-year mortality [adjusted Hazard Ratio (HR) 0.77 (0.60–0.99)]. In addition, in multivariate analysis, osteoporosis treatment adherence (PDC <0.50) was associated with lower mortality [adjusted HR 0.50 (0.40-0.57)].
Conclusions:
The implementation of a FLS protocol was associated with a significant reduction in one-year all-cause mortality and improved adherence to osteoporosis treatment, leading to fewer second fractures. However, five-year mortality remained unchanged, emphasizing the need for additional long-term interventions.

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PREDICTORS OF MOBILITY AND HAND GRIP STRENGTH RECOVERY IN HIP FRACTURE PATIENTS: THE ROLE OF OSTEOPOROSIS TREATMENT

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Objectives:
Hand grip strength (HGS) has been associated with numerous signs of aging and is a major symptom of sarcopenia, fragility, and mortality. Mobility score, on the other hand, is used to monitor post-operative recovery, and return to pre-fracture mobility is considered a quality indicator. This study aims to identify predictive factors for both parameters. Additionally, we evaluated the impact of anabolic and antiresorptive treatment on HGS and mobility after hip fracture in elderly patients.
Material and Methods:
We conducted a multicenter prospective cohort study including 91 patients over 60 years old who sustained a hip fracture and were treated with either antiresorptive (bisphosphonates, denosumab) or osteoanabolic agents (abaloparatide, teriparatide). Mobility and HGS were assessed at baseline and at 30-, 60-, and 90-days post-treatment initiation. Linear regression models evaluated predictors of functional recovery, adjusting for age, ASA score, pre-fracture mobility, and treatment type.
Results:
In the HGS regression model, increasing age was associated with lower HGS at all follow-ups (β=-0.237 to -0.538, p<0.05). How-

ever, results suggest that patients receiving osteoanabolic treatment experienced a smaller decline in HGS over time compared to those on antiresorptive therapy, although differences were not statistically significant.
For mobility, age was also a key determinant (β=0.065 to 0.097, p<0.05), while pre-fracture mobility had the strongest association with post-fracture mobility at all time points (β=0.699 to 0.808, p<0.01). Osteoanabolic treatment did not significantly improve mobility in regression models (p>0.05), but there was a trend toward slightly greater mobility recovery in the osteoanabolic group compared to the antiresorptive group.
ASA Score did not show a statistically significant association with either mobility or HGS recovery (p>0.05).
Conclusions:
Pre-fracture mobility and age are key determinants of functional recovery in hip fracture patients, whereas osteoporosis treatment plays a secondary role in short-term outcomes. Despite the lack of statistical significance, osteoanabolic treatment was associated with a better preservation of HGS and a slight trend toward greater mobility recovery. Future studies should explore long-term effects of osteoanabolic agents on functional improvement beyond 90 days.

P404

SPONTANEOUS REMISSION OF PRIMARY HYPERPARATHYROIDISM AFTER ACUTE SEVERE HYPERCALCEMIC CRISIS IN 80 YRS OLD PATIENT

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Objective: to describe an unusual case of primary hyperparathyroidism (PHPT) with acute hypercalcemic crisis which went into spontaneous remission after parathyroid auto-infarction.
Material and Methods: Neck images and laboratory tests including serial serum calcium and parathyroid hormone (PTH) were performed to evaluate parathyroid function and auto-infarction.
Case Report. A 80-year-old female patient presented during a heatwave in August 2023 with a 1-month history of lethargy, polyuria and general malaise with no neck discomfort. She was an old patient of the clinic monitored for a benign thyroid nodule. She is obese, with high blood pressure and chronically anticoagulated for atrial fibrillation. Four years before, a diagnosis of PHPT was made (Ca 10.7 mg/dl, PTH 94.7 pg/ml) and in the next 2 yrs both calcium and PTH increased (Ca 11.4 mg/dl, PTH 165 pg/ml). On admission her biochemistry showed Ca 14 mg/dL, PTH 716 pg/mL, 25-hydroxy vitamin D 17.4 ng/ml and normal renal function. After iv hydration she was given denosumab with unexpected halving of PTH 341 pg/mL in three days. Neck ultrasound showed a 1.4-cm hypoechoic nodular lesion with echogenic center, suggestive of a left superior parathyroid adenoma. 99Tc-sestamibi scan was negative. Computed tomography scan confirmed a 1.4-cm enlarged left superior parathyroid gland with inhomogeneous contrast uptake. The patient denied surgery. A cardiac MRI showed caseous necrosis of the mitral annulus, which could have explained the hypercalcemic crisis, but was excluded due to PTH dependence. 7 months after denosumab a recurrence of hypercalcemia (13.9 mg/dL), possibly due to a rebound effect[1], was managed with 4 mg zoledronic acid. Serum calcium fluctuated but normalized by July 2024, with a steady decline in PTH. At the last evaluation, after 18 mo., Ca 9.2 mg/dL, PTH 55 pg/mL. On ultrasound the adenoma was 8 mm, with a central cystic component.
Conclusion: This case highlights the very rare spontaneous resolution of severe primary hyperparathyroidism, with no neck discomfort and without recurrence for six months. In the absence of surgery, the mechanism of remission is a matter of speculation.
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P405

BISPHOSPHONATE THERAPY FOR REDUCED MINERAL BONE DENSITY AND PREVENTION OF VERTEBRAL FRACTURES IN PATIENTS WITH DIFFUSE IDIOPATHIC SKELETAL HYPEROSTOSIS (DISH) OF THE LUMBAR SPINE

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Background: Diffuse idiopathic skeletal hyperostosis (DISH), which has also been known as ankylosing hyperostosis, Forestier disease, and Forestier-Rotes-Querol disease, is a common condition of unknown etiology characterised by calcification and ossifications of the entheses affecting mainly the spine and peripheral joints (elbow, shoulder etc.) In end-stage DISH subjects due to the inability of the stiff spine to absorb tearing forces, the vertebral column becomes more vulnerable to trauma which leads to fractures even after relatively low energy trauma. Bisphosphonates are medications used for treatment of reduced mineral bone density and prevention of vertebral fractures.
Methods : We present a clinical case of an 68 year old male patient with a past medical hystory of diabetes mellitus type 2 and complain of low back pain, stiffness and limited range of motion of the lumbar spine. Physical examination includes labs, X ray, CT scan and DEXA scan.
Treatment : Bisphosphonates, pain relievers, physical therapy and exercises, swimming, weight and blood sugar control, surgery etc.
Results: Use of bisphosphonates in patients with reduced bone mineral density and diffuse idiopathic skeletal hyperostosis (DISH) inhibits bone resorption, increases bone strength and reduces risk of osteoporotic fractures.
Conclusion: The spine of patient with diffuse idiopathic skeletal hyperostosis (DISH) generally becomes increasingly rigid and osteoporotic and fractures may occur after even a relatively minor

trauma. Thus bisphosphonates are necessary for treatment in patients with DISH.

Keywords : Bisphosphonates, diffuse idiopathic skeletal hyperostosis (DISH), lumbar spine, prevention,vertebral fractures

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ANXIETY, DEPRESSION, AND PAIN INTERACTION IN FIBROMYALGIA: A PERSONALIZED MANAGEMENT PERSPECTIVE

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Fibromyalgia (FM) is defined as a clinical entity characterized by a multisymptom disorder that cannot be attributed to other diseases or alterations (1,2). Similar to other immune rheumatological conditions (3-5), the etiology and pathogenesis of FM are not yet fully understood (6). Its manifestations remain consistent across environmental, cultural, or socio-economic factors.

Objective: This observational prospective study aims to analyze the possible relationships between emotional variables, such as anxiety and depression, and pain perception in FM patients.

Patients and Methods: A total of 120 women (mean age 57.45 ± 6.1 years) previously diagnosed with FM and comorbid anxiety and/or depression participated in this research. The patients were selected based on clear inclusion and exclusion criteria. All participants provided written informed consent after being thoroughly informed about the study's purpose, as well as its potential benefits and risks. A multidimensional approach was employed to assess FM pain, including the following measures: Self-reported pain, evaluated using an 11-point numerical pain scale (VAS), Pressure pain sensitivity, assessed via pressure pain thresholds (PPT), Anxiety and depression levels, measured using the Hospital Anxiety and Depression Scale (HADS). The study protocol was approved by the local Ethics Committee and adhered to the principles of the Helsinki Declaration.

Results: The results revealed no significant interaction effects for pressure pain sensitivity parameters, anxiety, or depression ($p > 0.05$). However, a significant interaction effect was identified between depression/anxiety and self-reported pain ($p < 0.001$).

Conclusion: Extrinsic factors, such as those associated with psychiatric conditions, can significantly influence pain perception in FM. These findings underscore the necessity of adopting a personalized, differentiated approach to the management of FM for each individual patient.

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NON-TRAUMATIC MYOSITIS OSSIFICANS OF THE TIBIALIS ANTERIOR MUSCLE: FAVORABLE FUNCTIONAL RECOVERY FOLLOWING REHABILITATION THERAPY

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Non-traumatic myositis ossificans (MO) is a rare variant of MO where no apparent causative factor, such as trauma, can be identified (1). Similar to other rheumatological or orthopedic diseases (2-4) the pathophysiology remains unclear but may involve genetic, metabolic, or vascular factors leading to abnormal tissue differentiation and ossification. Differential diagnoses include soft-tissue sarcomas and other malignant lesions, necessitating biopsy for definitive diagnosis. Here, we report a case of non-traumatic myositis ossificans affecting the left tibialis anterior muscle in a 68-year-old female- a housewife residing in a rural area, with no history of local trauma. The patient has provided informed consent specifically for the publication of her medical case and approval from an Hospital Ethics Committee was obtained. The patient presented with pain and weakness in left foot motion, an altered gait persisting for more than two months, and unexplained weight loss without accompanying symptoms of anorexia or fever. Clinical symptoms, combined with imaging results, initially raised suspicion of a malignant lesion. However, a biopsy confirmed the diagnosis of non-traumatic myositis ossificans. The lesion caused significant limitation in dorsiflexion strength and

range of motion in the left foot. Conservative management was chosen due to the lesion's size and the patient's functional impairment. The treatment protocol included: local Low Laser Therapy (applied to reduce inflammation and pain), Shockwave Therapy (to improve local tissue function and promote healing, Kinesitherapy (focused on regaining range of motion, strength, and gait improvement). The evolution of the patient's pain and functional status was favorable in the short term, with improvement in gait pattern and a reduction in local pain. To assess the lesion's stability, to evaluate for potential complications and ensure long-term functional recovery, periodic monitoring was recommended. Conclusion: This case highlights the need to consider non-traumatic myositis ossificans in the differential diagnosis of soft-tissue masses, particularly in patients without a history of trauma. Biopsy is essential for a definitive diagnosis, and the early initiation of individualized conservative non-pharmacological therapy can lead to improved functional outcomes, as demonstrated in other rheumatological (5), metabolic (6) or orthopedic diseases (7).

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COMPLETE MANAGEMENT IN PATIENTS WITH CERVICAL RADICULOPATHY AND FIBROMYALGIA

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BACKGROUND:

Cervical radiculopathy (CR), a painful condition caused by nerve root compression in the cervical spine, is a leading cause of neck pain and disability worldwide, often resulting from intervertebral disc herniation, spinal canal narrowing, or positional cervical cord compression, all of which significantly impair quality of life. Fibromyalgia (FM), a chronic disorder marked by widespread pain, fatigue, sleep disturbances, and cognitive impairments, requires a combined approach of pharmacological and non-pharmacological therapies (1,2) to address its biopsychosocial complexities. Cervical spine compression can disrupt nerve signals and potentially intensify the central sensitization seen in fibromyalgia, where the central nervous system becomes hypersensitive to pain stimuli.

AIM:

In our study we investigated if complete management (ProHumano-SpineDinamic daily, 1 tablet, 2 months and rehabilitation program – educational measures, TENS, laser therapy, aerobic and proprioceptive exercises, daily, 12 sessions, followed by adapted home-trainig program) influence pain and functional status and improve quality of life in overlap condition – CR and fibromyalgia.

METHOD:

We performed a prospective randomized double-blind, controlled trial in outpatient medicine clinic. 58 LR patients (aged 35 – 48 years, 40 females, 18 males) were complete evaluated before rehabilitation program, to exclude the potential confounding comorbidities for cervical pain, and were randomly divided into the experimental group (EG - underwent complete program) and control group (CG - received only rehabilitation program, without SpineDinamic therapy). Improvement in pain (Visual Analog Scale – VAS, McGill questionnaire), and quality of life (Cervical Radiculopathy Impact Scale - CRIS) were compared. These outcomes were measured at baseline and post rehabilitation. We used SPSS Statistics 22.0 for the data analysis.

RESULTS:

Parameters in both groups had an improving trend. The VAS and McGill scores decreased significantly in the EG compared to the CG ($p < 0.001$ and $p = 0,004$, respectively). The CRIS score were significantly improved in EG. Between-group differences were statistically significant post rehabilitation ($p < 0.05$).

DISCUSSION AND CONCLUSION:

Our results sustained the well-known benefit of TENS, laser therapy and exercise program for clinical and functional status in fibromialgic patients diagnosed with CR. Combining SpineDinamic therapy with rehabilitation program might enhance both the altered pain perception and quality of life, due to the SpineDinamic effects on the normal functioning of the peripheral nervous system and on the musculoskeletal system health. Pain level and

quality of life in patients with the overlap between fibromyalgia and CR are deeply interconditioned and require both careful assessment and complete management. Understanding the potential interplay between cervical spine conditions and fibromyalgia can lead to better management strategies and improve the quality of life for those affected by these disorders.

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REHABILITATION IN PATIENTS WITH LOW-GRADE DEGENERATIVE SPONDYLOLISTHESIS AND OSTEOPOROSIS

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Background. Degenerative spondylolisthesis (DS) and osteoporosis (Op) are two complex diseases that affect the spine in people over 50 (1, 2), with clinical-dysfunctional impact that accumulates and impacts quality of life. In the early stage, both DS patients and those with Op may be asymptomatic and the rehabilitation program is selected in accordance with clinical and functional individual status.

The aim of the present study is to investigate if the rehabilitation program (pharmacological and educational measures, dietary with optimal sources of calcium and hygienic, posture and bracing, physical procedures - magnetotherapy, transcutaneous electrical nerve stimulation, low laser therapy for paravertebral and hip girdle muscles, and kinetic exercises) relieves pain and restores physical function and quality of life in 55 females with postmenopausal Op and DS with degree of slip ranged from 5%–25%, Meyerding grade I, during six months.

Methods. All patients (over 55 years old) were randomized (Study group - 28 patients, Control group – 27 patients) and complete assessed (standard laboratory tests, radiological examination of the lumbar column, dual energy X-ray absorptiometry, using a Stratos densitometer). Functional parameters (the VAS - Visual Analogue Scale, the SRM - Roland-Morris Disability Questionnaire, and the SF-MOS - Medical Outcomes Study Questionnaire Short Form 36 Health Survey) were measured at admission to inpatient rehabilitation (T1), after 4 weeks (T2), and 6 months (T3) following the commencement of rehabilitation. We used Student's t test to compare study and control groups for each measured variable and each moment, and ANOVA to compare the three sets of result obtained for each measured variable over time.

Results. There is a highly significant difference between the values of the studied parameters (VAS, SRM and SF-MOS) of the subjects in the study group and those in the control group, those in the study group having higher average values than the others for VAS ($p = 0.00000079 < 0.001$) and SRM ($p = 0.000016 < 0.001$), but lower than the others ($p = 0.000000014 < 0.001$) for SF-MOS. The results confirmed the complex dimension of the level of functionality and the results had not statistical significance in the T2 and T3 assessment.

Conclusions. Careful assessment in osteoporotic patients with DS is necessary to establish the level of all clinical and functional parameters (range of motion, muscle grading and strengthen, activities of daily living impairment, gait) for vertebral column and lower limbs. Non-surgical care and rehabilitation program is one of the optimal choices in osteoporotic patients with minimal DS, especially after 60 years old. Bracing and exercises are essential in the correction of fall risk, vertebral slippage and preventing the vertebral fractures and other neurological complication.

Keywords: Degenerative spondylolisthesis, Postmenopausal osteoporosis, Rehabilitation

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ANALYSIS OF BONE TISSUE STATUS IN ADOLESCENTS TAKING INTO ACCOUNT BSML AND FOKL POLYMORPHISMS OF THE VDR GENE

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Objectives: To determine the features of the state of bone tissue in children of different sexes in puberty based on the study of densitometry indicators and BSML and FokI polymorphisms of the VDR gene.

Materials and methods: 157 children aged 10-17 years were examined. They were divided into two groups depending on gender: 83 males and 74 females. Inclusion criteria: absence of chronic somatic and endocrine pathologies, hereditary and genetic diseases. Children presented to University Pediatric Clinic for routine examination, ultrasound densitometry (QUS) (Sonost-2000, Korea) and dual-energy X-ray absorptiometry (DXA) (HOLOGIC QDR W Explorer, USA) were performed according to indications, molecular diagnostics: BSML and FokI polymorphisms of the VDR gene. According to the recommendations of The International Society For Clinical Densitometry, 2019, the criterion for reducing of

bone mineral density was considered the BMDZ-score ≤ -2.
Results: 89 children, according to QUS, showed normal bone mineral density indicators with a Z-score value of -1.2 ± 0.56 in males; -1.4 ± 0.44 in females. Pathological mutations (heterozygous and homozygous) of the BSML polymorphism of the VDR gene were detected in 47 % of males and 57.2 % of females, and pathological mutations of the FokI polymorphism of the VDR gene were founded in 66.7 % of males and in 85.7 % of females.
Low bone mineral density was diagnosed in 68 adolescents, namely in 40.9% of males (Z-score -2.3 ± 0.32) and 45.9 % of females, in whom the Z-score was -2.4 ± 0.31. 44 % of males had pathological mutations of the BSML polymorphism of the VDR gene and 71.4 % of males had the FokI polymorphism of the VDR gene. 56.2 % of females who had low bone mineral density had pathological mutations of the BSML polymorphism of the VDR gene and 62.5 % had the FokI polymorphism of the VDR gene. Adolescents who had a decrease in bone mineral density according to the results of QUS underwent DXA, which confirmed the results.
Conclusions: Decreased of bone mineral density was shown in 40.9 % of males and 45.9 % of females, while low bone mineral density was detected more often in females than in males.
Also, pathological mutations of the BSML and FokI polymorphisms of the VDR gene dominate in the examined children, which indicates a predisposition to impaired mineral metabolism and the need to carry out preventive measures to maintain the health of bone tissue.

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UNVEILING THE TREATMENT GAP IN THE VERY ELDERLY WITH FRAGILITY FRACTURES: A TETRIARY CENTRE'S EXPERIENCE IN PORTUGAL

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Objectives: This study aims to assess the delay in osteoporosis (OP) treatment among elderly patients referred to rheumatology due to fragility fractures. The secondary objective is to assess adherence to Portuguese recommendations for screening, diagnosis and management of OP in elderly patients.
Methods: This single-centre retrospective observational study included patients aged over 80 years old, who were referred between 2023 and 2024 to a Portuguese tertiary rheumatology department, in Lisbon, as part of a secondary fracture prevention program. Demographic, clinical and analytical data were collected through a review of electronic medical records.
Results: A total of 53 patients were included (84,9% female and 15,1% male) with a mean age of 84 (±3 SD) years. The mean time of delayed treatment after a fragility fracture was 3,7 (±5,3 SD) years. The most common initial fractures were vertebral (64,2%) followed by hip fractures (15,1%). The mean number of fragility fractures before the first rheumatology evaluation was 2,9 (±1,6 SD). Seventeen patients (32,1%) had a dual-energy X-ray absorptiometry compatible with OP before the sentinel fracture and only three (17,6%) of them were treated with anti-osteoporotic drugs before the first fracture. Thirty-six patients (67,9%) were never screened for OP before their first fracture.
Conclusion: This study highlights the lack of adherence to the Portuguese OP guidelines in very elderly individuals, not only concerning its screening but also the beginning of anti-osteoporotic treatment after OP diagnosis and/or after a fragility fracture. Despite the challenges of managing osteoporosis in this age group, it is important to address the increased risk of fractures after a sentinel fracture to reduce morbidity and mortality. We consider that adhering to national guidelines and implementing secondary fracture prevention programs are essential steps in improving outcomes for this population.

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SKELETAL COMPLICATIONS IN ADULT PATIENTS TREATED FOR TYPE 1 GAUCHER'S DISEASE (GD1): SINGLE CENTER EXPERIENCE

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Introduction: Skeletal complications in adult patients with GD1 are common and represent significant comorbidity burden contributing to chronic pain, decreased quality of life, mobility and physical performance.

Study design: We conducted an observational cross-sectional study in adult patients with GD1 treated at the University Clinical Center of Serbia over the last 2 decades.
Aim: To investigate prevalence of skeletal complications and associated risk factors in GB1 and compare bone mineral density (BMD) parameters with matched controls.
Patients and methods: Study included 26 patients diagnosed with GB1 (14 females (53,8%), 7 postmenopausal) median age 49 (range 27-70) years. Age and sex matched control group of 20 healthy subjects (11 female (55%), 7 postmenopausal) median age 52.5 (range 24-79) years, was used for comparisson. Median age at diagnosis was 21.5 (range: 2-49) years, median duration of specific treatment for GD1 was 14.6 (range: 1-25) years. Two thirds of GB1 patients received enzyme replacement (ER) 16/25 (65%), one third 10/25 (36%) substrate reduction treatment (SRT). Clinical, genetic and osteodensitometric data were collected and analysed statistically.
Results: Skeletal complications were reported in majority of patients with GD1: bone pain (76.9%), deformities (58.8%), bone crises 38.5%, fractures (23%). Decreased bone mineral density (BMD) at lumbar spine or hip was more prevalent i GD1 group (18/26) compared to controls (9/20, p=0.05). Mean T score values at lumbar spine, but not hip (femoral neck), were significantly lower in patients compared to controls (-1.6±1.5 vs 0.01±1.3, p<0.01).
The most prevalent genotype in our cohort, N370S/RecNcil (23%) was associated with 1) significantly lower spine and hip T score

values compared to other GB1 genotypes (p=0.023), and higher prevalence of bone crises (83.33% vs 20%, p=0.05).
Eight out of 26 (30.7%) GB1 patients underwent splenectomy. T score values (hip or spine using the worst value) were significantly lower in these patients (-2.8±1.5 splenectomzed vs GB1 alone -1.4±1.1, p=0.014), and bone crises more prevalent (6/8 (75%) vs GB1 alone 4/18 (22.2%), p=0.026).
SRT induced statistically significant improvement in hip T score values compared to ER (mean delta T score difference 0.22±0.62 for SRT vs -0,2±0.4, p=0.048 for ER), finding related to duration of follow-up/treatment period (P=0.039).
Conclusion: Lumbar spine T scores in GB1 are significantly lower compared to matched healthy controls. N370S/RecNcil genotype and splenectomy were associated with lower T score values at spine/hip and higher prevalence of bone crises in our GB1 cohort. SRT induced more significant improvement in hip T scores compared to ER.

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THE ROLE OF LASER THERAPY IN MANAGING OSTEOPOROSIS AND PSORIATIC ARTHROPATHY

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Background
Psoriatic arthropathy (PsA) is a chronic inflammatory disease affecting joints, skin, and entheses, frequently associated with systemic complications such as osteoporosis (OP). Chronic inflammation, corticosteroid use, and altered bone remodeling significantly contribute to the prevalence of OP in PsA patients. Laser therapy has emerged as a potential adjunctive treatment to systemic therapies, offering benefits for both skin lesions and entheses, and potentially improving bone health.
Objectives
This study aimed to evaluate the prevalence and progression of osteoporosis in PsA patients, its impact on disease activity and quality of life, and the potential benefits of laser therapy as an adjunct to standard PsA management.
Methods
A prospective study of 78 PsA patients diagnosed using CASPAR criteria was conducted. Patients were divided into two groups: one receiving standard systemic therapy (methotrexate and biologics) and the other combining systemic therapy with laser treatment targeting skin lesions and entheses. Bone mineral density (BMD) was measured using DXA at baseline and six months. Disease activity was assessed using the Disease Activity in Psoriatic Arthritis (DAPSA) score, while skin severity was measured with the Psoriasis Area and Severity Index (PASI). Quality of life and functional impairment were evaluated using PsAQoL and HAQ-DI.
Results
Osteoporosis was identified in 34.6% of patients, predominantly in postmenopausal women and those aged >60 years. Patients with osteoporosis exhibited higher DAPSA scores (p<0.05), reduced physical function, and worse quality of life (PsAQoLscores 23% lower, p<0.01). The laser therapy group showed significant reductions in PASI (-65% vs. -42%, p<0.01) and DAPSA scores (-35% vs. -22%, p<0.05) compared to the control group. Notably, 15% of patients in the laser group demonstrated improved BMD, compared to 8% in the control group.
Conclusions
Osteoporosis significantly exacerbates the burden of PsA, highlighting the need for integrated management. Laser therapy, as an adjunct to systemic treatments, not only improves skin and joint outcomes but also shows potential benefits for bone health. These findings advocate for the inclusion of laser therapy in comprehensive PsA treatment strategies to enhance patient outcomes and address comorbidities like osteoporosis.

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ONE-YEAR MORTALITY RATES OF FRAGILITY FRACTURES OF THE PELVIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Objective: This study investigates the one-year mortality of fragility fractures of the pelvis (FFP) patients categorized under this system and treated with surgery or conservative methods, aiming to assess the algorithm's effectiveness. **Material and Methods:** We systematically searched PubMed, Embase, Scopus, and Web of Science for English studies on the one-year mortality of FFP with no publication date restrictions. Study quality was assessed using the Newcastle-Ottawa Scale. Pooled one-year mortality rates were calculated using random-effects models. Additionally, if applicable, odds ratios (OR) with 95% confidence intervals (CI) were employed. PRISMA guidelines were followed for reporting, and the study was registered with PROSPERO. **Results:** Analysis of 22 studies encompassing 3265 patients with FFP revealed a concerning overall one-year mortality rate of 15.5%. Mortality varied by fracture type, with FFP IV having the lowest rate (7.5%) and FFP III having the highest (17.0%). All studies concurred on conservative treatment for FFP I. For other fracture types, mortality rates differed between conservative and surgical approaches. Conservative treatment resulted in rates of 14.9%, 21.8%, and 5.1% for FFP II, III, and IV, respectively. Conversely, surgical treatment yielded mortality rates of 16.8%, 19.5%, and 24.2% for FFP II, III, and IV, respectively. **Conclusion:** Fragility fractures of the pelvis have high mortality, especially in FFP III. Conservative treatment may be suitable for FFP I, while surgery might be better for FFP III. The rarity of FFP

IV fractures limits conclusions, and FFP II fractures lack a clear treatment consensus. Further research is needed to optimize management for these fracture types.

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ARE THERE DIFFERENCES IN THE CALCULATIONS OF THE LSC IN TBS IF WE EXCLUDE SOME REGIONS OF INTEREST?

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Introduction:
TBS is a gray-level texture measurement acquired from DXA images of the lumbar spine and is an indirect index of microarchitecture. It is currently considered a useful tool for decision-making in the approach to patients with osteoporosis. According to recommendations recently issued by the European Society for Clinical and Economic Aspects of Osteoporosis, Osteoarthritis, and Musculoskeletal Diseases (ESCEO) and the International Osteoporosis Foundation (IOF), TBS may be useful for monitoring treatment with denosumab and anabolic drugs. According to ISCD recommendations, regions with severe structural or pathological artifacts (e.g., flat spine, laminectomy, hardware, metastatic lesions) should not be reported. For this reason, the aim of our study was to evaluate the precision error (PE) and least significant change (LSC) according to the inclusion of all regions of interest (L1-L4), 3 vertebrae (L1-L3, L2-L4), and 2 vertebrae (L1-L2, L2-L3, L3-L4).
Materials and methods
A prospective design study was carried out to evaluate the accuracy and LSC in a reference center in the city of Buenos Aires during 2024. Thirty representative women from the center were included to be scanned two times after repositioning, ensuring degrees of freedom for a 95% CI. The coefficient of variation, PE, and LSC were calculated according to the International Society for Clinical Densitometry guidelines. CL BMD (g/cm²) was measured using a GE Lunar Prodigy device (GE Lunar, Madison, WI, USA), and TBS version 3.0.2.0 was used for analysis.
Results
Mean age of the sample was 64.72±12.31, and weight was 65.18±13.22 (kg). EP according to the regions included were as follows: L1-L4 (1.5%), L1-L3 (1.75%), L2-L4 (1.61%), L1-L2 (2.05%), L2-L3 (1.97%), L3-L4 (1.68%). The LSC in % was for L1-L4 (4.15%), L1-L3 (4.45%), L2-L4 (4.45%), L1-L2 (5.69%), L2-L3 (5.45%), and L3-L4 (4.68%). L1-L4 showed less variability compared to L1-L2 (0.012 vs. 0.017; p = 0.0015) and L2-L3 (0.012 vs. 0.016; p = 0.0033).
Conclusions
In clinical practice there are situations where regions of interest should be ruled out. In accordance with recent recommendations by ESCEO on treatment monitoring and TBS, we believe it is appropriate for each center to be able to evaluate the LSC for different vertebral combinations.

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METABOLIC COMORBIDITIES AND OSTEOPOROSIS IN OSTEOARTHRITIS – A COMPLEX INTERACTION

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Background: Osteoarthritis (OA) is a degenerative joint disease marked by cartilage loss, subchondral bone remodeling, and chronic inflammation. In addition to its musculoskeletal impact, OA is closely associated with metabolic comorbidities such as obesity, type 2 diabetes mellitus (T2DM), and dyslipidemia. Osteoporosis (OP), a systemic skeletal disorder characterized by low bone mineral density (BMD), frequently coexists with OA and metabolic disorders, amplifying the disease burden and complicating management.
Objectives: To assess the prevalence of metabolic comorbidities and osteoporosis in patients with OA, explore the interplay between these conditions, and analyze their combined impact on disease severity, progression, and quality of life.
Methods: A cross-sectional study was conducted involving 180 patients with primary OA diagnosed per ACR criteria. Clinical assessments included demographic and metabolic profiling, radiographic grading (Kellgren-Lawrence scale), and BMD measurements using DXA. Metabolic comorbidities were identified through medical history, laboratory tests (lipid profile, fasting glucose), and anthropometric measurements. Statistical analyses were performed to examine associations between metabolic comorbidities, OP, and OA severity.
Results: The mean age of participants was 64.2 ± 7.1 years, with 68% being women. Osteoporosis was diagnosed in 36% of patients, primarily in postmenopausal women and individuals over 65 years. Metabolic comorbidities were highly prevalent, including obesity (45%), T2DM (30%), and dyslipidemia (32%). Patients with coexisting OP and metabolic disorders demonstrated significantly higher KL grades (III-IV) and worse WOMAC scores in pain, stiffness, and physical function domains ($p<0.001$). Reduced BMD was strongly associated with obesity and T2DM ($p=0.004$ and $p=0.01$, respectively). Elevated systemic inflammation (CRP >10 mg/L) and insulin resistance (HOMA-IR >2.5) were identified as independent predictors of OP and metabolic comorbidities in OA patients.
Conclusions: Osteoporosis and metabolic comorbidities are highly prevalent among OA patients, exacerbating disease severity and functional limitations. The interplay of systemic inflammation and metabolic dysregulation underscores the need for a multidisciplinary management approach targeting both OA and its comorbid conditions. Comprehensive strategies addressing bone health, metabolic control, and lifestyle interventions are critical to improving patient outcomes. Future research should focus on the pathophysiological connections between OA, OP, and metabolic disorders to develop targeted therapeutic approaches.

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OSTEOPOROSIS AND OSTEOARTHRITIS – INTERSECTING PATHOLOGIES IN A COMORBID LANDSCAPE

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Background: Primary osteoarthritis (OA) is a chronic degenerative disease primarily affecting cartilage, subchondral bone, and synovium. Alongside OA, osteoporosis (OP) emerges as a common comorbidity, both sharing risk factors such as aging, obesity, and systemic inflammation. The coexistence of OA and OP complicates disease progression and management, necessitating an integrated clinical approach to address overlapping pathophysiology and improve patient outcomes.
Objectives: This study investigates the prevalence of osteoporosis in patients with primary OA, explores the interrelationship between these conditions, and evaluates the influence of comorbidities on disease severity, functional impairment, and quality of life.
Methods: A cross-sectional study was conducted on 150 patients diagnosed with primary OA according to the ACR criteria. Comprehensive assessments included clinical examination, Kellgren-Lawrence (KL) radiographic grading for OA, and dual-energy X-ray absorptiometry (DXA) for bone mineral density (BMD). Disease severity and functional limitations were evaluated using the WOMAC index. Comorbidities, including osteoporosis, were identified through clinical history, laboratory testing, and imaging. Statistical analyses were performed to identify correlations between OA, OP, and other comorbid conditions.
Results: The study cohort had a mean age of 63.8 ± 7.2 years, with a female predominance (72%). Osteoporosis was diagnosed in 36% of patients, with higher prevalence in postmenopausal women and individuals aged >65 years. Comorbid conditions included obesity (46%), hypertension (58%), and type 2 diabetes mellitus (31%). Patients with coexisting OP and OA reported significantly worse WOMAC scores in pain ($p=0.02$) and physical function domains ($p<0.01$). Advanced KL grades (III-IV) were associated with reduced BMD at the femoral neck ($p=0.001$) and lumbar spine ($p=0.003$). Obesity and metabolic syndrome further exacerbated disease severity and functional decline.
Conclusions: Osteoporosis and osteoarthritis often coexist, creating a synergistic burden that worsens clinical outcomes. This study underscores the need for early diagnosis and integrated management of these conditions, addressing both joint and bone health. Targeted interventions, including weight management, bone-strengthening therapies, and multimodal pain management, are essential to improve patient quality of life and reduce disability. Further research should explore the shared inflammatory and metabolic pathways underlying OA and OP to develop more effective therapeutic strategies.

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THE ROLE OF IMMUNOMODULATORS IN OSTEOARTHRITIS (GONARTHRITIS)

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Objective: This study evaluates hydroxychloroquine's potential as a disease-modifying therapy for knee osteoarthritis, focusing on its anti-inflammatory effects, symptom relief, and progression slowing in inflammatory cases.
Material and Methods: A double-blind, placebo-controlled trial was conducted at the University Hospital Center "Mother Teresa" in Tirana, involving patients with primary gonarthritis classified as Kellgren and Lawrence grade II or III. Participants were randomly assigned to receive either hydroxychloroquine tablets (200 mg twice daily) or placebo. Symptom progression was monitored using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) at baseline and at 6, 12, 18, 24, 30, and 36 weeks.
Results: Thirty patients were included, with 14 in the hydroxychloroquine (HCQ) group and 16 in the placebo group. Mean ages were 62.8 ± 7.0 years and 62.4 ± 6.4 years, respectively, with no significant baseline differences. At 36 weeks, the HCQ group showed significant improvements in knee pain, stiffness, and function compared to placebo, as reflected in WOMAC total and subscale scores. The placebo group exhibited notable improvement at week 6, with no further significant progress, while the HCQ group experienced substantial improvement at week 12, continuing throughout the follow-up. Significant differences between groups were observed at all assessed intervals. Three patients in the HCQ group reported diarrhea and headache; no side effects were noted in the placebo group. Additionally, the HCQ group consumed fewer painkiller pills on average throughout the trial.
Conclusion: Hydroxychloroquine demonstrates potential as an immunomodulatory treatment for gonarthritis, providing significant symptom improvement in mild to moderate cases. These findings suggest that immunomodulators could serve as promising alternatives to traditional therapies.

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THE ROLE OF INTERFERONS IN THE DEVELOPMENT OF CLINICAL MANIFESTATIONS OF SYSTEMIC LUPUS ERYTHEMATOSUS

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Objective: To study and summarize the data on the mechanisms of production and influence of type I INF on the course of SLE.
Methods: Data from PubMed Central were analyzed.

Results: The earliest disturbance in the immune system in SLE patients is an increase in type II INF (IFNγ) levels, detectable more than 4 years before disease onset and autoantibody detection. IFNγ is expressed by many cells of both the innate and adaptive immune system, including T and B cells, and, like other IFNs, transmits signals through the JAK-STAT pathway. The activity of IFNγ and related genes correlates with SLEDAI score and antibody levels to double-stranded DNA, further indicating its role in pathologic autoantibody production. Sirobhushanam S. et al. showed that levels of circulating type I IFN correlate with SLE activity. Large studies have identified specific effects of IFNs that contribute to specific organ damage. A direct effect of type I INF on bone marrow has been revealed: INFα suppresses bone marrow production, resulting in leukopenia, anemia and thrombocytopenia. The contribution of type I INF to lymphopenia in patients with SLE is further supported by data from clinical trials with anifrolumab, in which blockade of the type I IFN receptor was accompanied by normalization of lymphocyte counts. Also, IFN blockade with anifrolumab improved skin manifestations of SLE: the activity and severity index of cutaneous lupus erythematosus improved by more than 50%. In vitro studies in mice have long established the role of IFN in the pathophysiology of lupus nephritis: INF type I receptor deficiency reduces the risk of nephritis, while systemic administration of INFα and INFβ to mice increased tubular inflammation and proteinuria, decreased differentiation of renal progenitor cells into podocytes, promoting scar formation, and led to therapy resistance. The role of INFγ is less studied but may also contribute to lupus nephritis. Studies of synovial tissue from patients with arthritis in SLE have shown increased expression of type I INFγ, which is different from rheumatoid arthritis and osteoarthritis. A recent analysis showed that INFγ may correlate more strongly with lupus arthritis compared with other clinical manifestations. INFs affect endothelial cell function and thus are involved in increasing cardiovascular risk in SLE.
Conclusion: Thus, IFNs are one of the key links in the pathogenesis of SLE, they participate in the development of lesions of the main target organs, which explains the increased interest in the use of antibodies to type I interferon receptors.

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"HOME REHABILITATION IN PATIENTS WITH FRACTURES: FUNCTIONAL IMPROVEMENT AND TREATMENT EFFICIENCY"

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OBJECTIVE: Our Rehabilitation Service (RHB) provides treatment both at outpatient and home level to public health patients in the Eixample Esquerra area of Barcelona, assisting a population of approximately 154,413 inhabitants, of which more than 12% are over 70 years of age. The aim of this study is to analyse the functional results of fractures that received rehabilitation treatment at home by our service during the year 2024.

MATERIAL AND METHODS: Patients treated at home for fractures in 2024.Design:Prospective descriptive study. January-December 2024. n=207. Variables: age, sex, diagnosis, Barthel index (previous, initial and discharge), functional improvement (increase in Barthel) and RHB sessions performed (number). A descriptive analysis of the data was performed. The qualitative variables are presented in absolute frequency and percentage (%) and the quantitative variables with mean and standard deviation (SD).
RESULTS: Of 1,041 patients treated at home, 207 had fractures. Population: 78.3% female, mean age: 81.12 years (SD:8.19) and 21.7% male, mean age: 74.3 years (SD:9.21). Aetiology: 66.3% femur fractures, 19.2% humerus fractures, 10.4% branch/pelvic fractures and 5.4% ankle fractures. In 24 patients (11.6%) there were multiple fractures (most frequent association femur and humerus (n=9)). Middle Barthel – pre-fracture 79.05, initial RHB 57.90 and discharge 73.06 points. Mean functional improvement: increase of 15.16 Barthel points (SD: 5.32), with a mean of home RHB sessions of 11.92 (SD: 4.01)
CONCLUSIONS: The RHB treatment of fractures at home achieves an efficient functional outcome (Barthel increase 15 points) with a tight number of sessions. The results obtained are comparable (Barthel increase and number of RHB sessions) to those observed in fractures treated on an outpatient basis in our department in patients of the same age range.

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FUNCTIONAL RESULTS OF THE FAST-TRACK HOME REHABILITATION PROGRAM IN TOTAL HIP AND KNEE ARTHROPLASTIES

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OBJECTIVES: Our physical medicine and rehabilitation department treats patients in the basic health areas of the Eixample Esquerre, Barcelona; assisting a population of approximately 154.413 inhabitants, in which more than 25% over 65 years of age. Our study aims to analyze the functional outcome of total hip arthroplasty(THA) and total knee arthroplasty(TKA) under a fast-track program, performed as a home-based rehabilitation treatment(HRT) during 2024.
MATERIAL AND METHODS: Prospective descriptive study. From January to December 2024. N = 141.Patients under home based rehabilitation for THA and TKA. Variables: age, sex, Barthel index-(previous, initial and discharge), functional improvement(Barthel increase) and rehabilitation sessions performed(number). Descriptive data analysis. Qualitative variables are showed as absolute frequency and percentage(%), and quantitative variables are showed as mean and standard deviation(SD).
RESULTS: Of the 975 patients assessed under HRT, 141 were THR and TKA. THR: n = 45, women 60,52%, mean age 72,90(SD 9,15) and 39,48% men, mean age 73,52 years(SD 8,02). Average Barthel: initial 67,40, at discharge 92,10, mean functional improvement 24,70 points, with a mean of rehabilitation sessions 12.21(SD

2.01). TKA: n = 96, women 69,80%, mean age 80,01(SD 9,18) and 30,20% men, mean age 73,9 years(SD 10,11). Average Barthel: initial 71,30, at discharge 95,97, average functional improvement 24,67 points, with an average of sessions of rehabilitation 12,01(SD 1,81).

CONCLUSIONS: HRT under a fast-track program for THA and TKA achieves an efficient functional outcome (Barthel increase> 24 points) with an adjusted number of sessions, similar to that accomplished at the outpatient level, avoiding the complications and costs derived from the patient's displacement to the rehabilitation center.

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OSTEOPOROSIS, SARCOPENIA, OSTEOSARCOPENIA, AND THEIR ASSOCIATIONS WITH THE PRESENCE OF RECENT FRAGILITY FRACTURES IN LATE POST-MENOPAUSAL WOMEN: EXPLORING THE CROSSTALK BETWEEN BONE AND MUSCLE IN THE FRISBEE 2 COHORT STUDY

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Objective: We assessed the associations between osteoporosis, sarcopenia, osteosarcopenia with the presence of fragility fractures in the past two years in community-dwelling postmenopausal women from the *Fracture Risk Brussels Epidemiological Enquiry (FRISBEE2)* cohort.

Methods: Retrospective cohort design. The FRISBEE2 cohort study included 907 community-dwelling postmenopausal women in Belgium. Sarcopenia (according to eight definitions: EWGSOP2 "probable" and "confirmed"; IWGS; SCWD; SDOC; FNIH; Baumgartner; and Newman), osteoporosis (T-score BMD of lumbar spine, total hip, or femoral neck ≤-2.5 SD), and osteosarcopenia (8-combination-based approach) were assessed at baseline. We recorded and validated recent (i.e., within the 2 years *before* baseline) central or major osteoporotic -MOF- fractures (dichotomous variable). Multivariate regression models, adjusted for age, BMI, sedentary lifestyle, and comorbidities were used to evaluate the associations between osteoporosis, sarcopenia, and osteosarcopenia at baseline and the presence of recent fragility fractures.

Results: Forty-seven (5.2%) of the 907 included women aged 77 (75–81) years had experienced recent central or MOFs in the 2 years prior to study inclusion. The crude analysis showed significant associations between osteoporosis, sarcopenia, and osteosarcopenia, and the presence of a recent fracture. In a multivariate analysis, only EWGSOP2 "probable" sarcopenia, defined by a low handgrip strength, was associated with a history of recent fracture [OR= 2.14 (1.05-4.35); p= 0.035]. As expected, the prevalence of sarcopenia (ranging from 5.6% by SCWD to 35.9% by Baumgartner definition) and osteosarcopenia (2% by osteoporosis & SCWD to 11.4% by osteoporosis & Baumgartner definition) at baseline varied widely depending on the definitions used.

Conclusions: Postmenopausal women with a history of recent fragility fracture had a low handgrip strength (EWGSOP2 "probable" sarcopenia), highlighting the close crosstalk between bone and muscle strength. The presence of a recent central or MOF fracture in a post-menopausal woman should alert on probable sarcopenia. Further longitudinal, prospective studies are needed to explore the role of muscle strength as a potentially modifiable, treatable clinical risk factor for fragility fractures.

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SARCOPENIA AND ELECTROCARDIOGRAPHIC MARKERS OF ARRHYTHMIA RISK IN OLDER ADULTS

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Background: Cardiac arrhythmias are prevalent among older adults and significantly increase morbidity and mortality. Sarcopenia, a progressive skeletal muscle disorder, is associated with systemic inflammation, oxidative stress, and structural remodeling, potentially affecting cardiac function. This study investigates the relationship between sarcopenia and electrocardiographic (ECG) parameters indicative of arrhythmia risk.

Methods: A cross-sectional retrospective study was conducted with 283 community-dwelling older adults (≥60 years) who underwent comprehensive geriatric assessments. Sarcopenia was diagnosed based on the EWGSOP2 criteria, incorporating handgrip strength (35 kg for male and 20 kg for female) and skeletal muscle mass index (SMMI) (SMM/BMI). ECG parameters, including QTc interval, P-wave dispersion, Tp-Tend interval, and fragmented QRS, were measured. Multivariate logistic regression was performed to analyze the association between sarcopenia and ECG abnormalities.

Results: Sarcopenia was identified in 35.7% of participants, who were older (mean age 75.9 ± 6.3 years, p < 0.001) compared to

non-sarcopenic individuals. Fragmented QRS (17.0% vs. 8.2%, p = 0.032) and atrial fibrillation (6.9% vs. 1.6%, p = 0.038) were significantly more prevalent in sarcopenic patients. P-wave dispersion, which reflects atrial electrical heterogeneity and remodeling, a known predictor of atrial fibrillation, was higher in the sarcopenia group (51.95 ± 16.94 ms vs. 46.79 ± 16.66 ms, p = 0.042). Fragmented QRS, an indicator of heterogeneous ventricular depolarization often associated with myocardial fibrosis or scarring, was independently associated with sarcopenia (OR: 2.415, 95% CI: 1.051–5.547, p = 0.038) in multivariate analysis.
Conclusion: Sarcopenia is associated with significant alterations in ECG parameters indicative of arrhythmia risk, including fragmented QRS and P-wave dispersion. These findings suggest that sarcopenia may contribute to electrical remodeling and arrhythmogenesis. Further prospective studies are warranted to explore the causal pathways linking sarcopenia and arrhythmias.

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THE ROLE OF MEDICATION TYPE IN OSTEOPOROSIS TREATMENT: EFFECTS ON ADHERENCE, PERCEPTION, AND BELIEFS

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Objective: This study investigates the often-overlooked impact of medication type (oral versus injectable) on adherence, illness perception, and beliefs about medication in osteoporosis patients.
Material and Methods: A total of 272 osteoporosis patients, already using either 'weekly oral treatment' (n=105) or 'biannual injection' (n=167), were included in the study. Statistical analyses were conducted to evaluate differences in medication adherence, illness perception, and beliefs about medicines between these groups. All participants completed the Clinical Information Form, the Medication Adherence Report Scale, the Brief Illness Perception Questionnaire, and the Beliefs about Medicines Questionnaire. Statistical analyses were performed using Statistical Package for the Social Sciences (SPSS) Version 23.
Results: Independent samples t-test revealed no significant overall differences between the groups. A borderline significant difference was observed for the specific-concerns scale, a subscale of the Brief Illness Perception Questionnaire (t[270]=1.966, p=0.050), supported by Mann-Whitney U test results (U=7563, p=0.056). The biannual injection group (M=16.98, SD=4.23) scored higher than the weekly oral medication group (M=15.93, SD=4.34).
Conclusion: These findings suggest that the type of medication does not significantly affect patients' adherence, illness perception, or beliefs about the necessity of medication. However, medication type seems to influence specific concerns related to treatment. These results emphasize the importance of considering medication type in osteoporosis treatment planning and developing patient-centered strategies to improve outcomes. This approach not only enhances patient satisfaction but also positively impacts the overall effectiveness of healthcare services.

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INTERRELATION OF SARCOPENIA, OSTEOPOROSIS, AND OSTEOARTHRITIS: CLINICAL IMPACT AND MULTIDISCIPLINARY MANAGEMENT

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Background Sarcopenia, osteoporosis, and osteoarthritis often coexist in older adults, exacerbating functional decline, fall risk, and reduced quality of life. Sarcopenia leads to muscle loss and weakness, increasing vulnerability to osteoporosis-related fractures and osteoarthritis-associated joint degeneration. A comprehensive understanding of these interrelated conditions is crucial for improving patient outcomes.
Objectives To evaluate the prevalence, clinical impact, and interrelationship of sarcopenia, osteoporosis, and osteoarthritis in patients, emphasizing their combined effect on physical performance and quality of life.
Methods A cross-sectional study was conducted involving 46 patients (mean age: 67.3 ± 6.8 years; 63% female). Sarcopenia was diagnosed using EWGSOP2 criteria, incorporating grip strength and appendicular lean mass. Osteoporosis was confirmed via DXA (lumbar spine and femoral neck), while osteoarthritis severity was assessed using the Kellgren-Lawrence grading system. Functional capacity and quality of life were evaluated using the Short Physical Performance Battery (SPPB) and HAQ-DI, respectively. Statistical analyses assessed correlations between these conditions and their impact on outcomes.
Results Sarcopenia was present in 43.5% of patients, with a higher prevalence among those with osteoporosis (58%) and osteoarthritis (61%). Osteoporosis was confirmed in 52.2% of patients, predominantly women, with significantly lower BMD at the lumbar spine (-2.9 ± 0.4) and femoral neck (-2.6 ± 0.5). Osteoarthritis affected 65.2% of patients, primarily the knee and hip joints, with Kellgren-Lawrence grade III or IV observed in 48.7%. Patients with overlapping conditions exhibited worse physical performance (SPPB: 6.8 ± 1.9, p<0.01) and greater functional impairment (HAQ-DI: 1.98 ± 0.4, p<0.001). Sarcopenia and osteoporosis were significantly associated with an increased fall risk, while osteoarthritis severity correlated with higher pain levels and disability.
Conclusions The coexistence of sarcopenia, osteoporosis, and osteoarthritis amplifies functional decline and reduces quality of life. These findings highlight the importance of early detection and integrated management strategies targeting muscle strength, bone health, and joint stability to mitigate the impact of these conditions. Multidisciplinary approaches, including physical therapy, nutrition, and pharmacological interventions, are essential for optimizing care and outcomes.

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X-RAY CHANGES IN THE EXPERIMENT WITH INTRA-ARTICULAR INJECTION OF SODIUM MONIODOACETATE AND SYNOVIAL FLUID OF A PATIENT WITH OSTEOARTHRITIS INTO THE KNEE JOINT OF RATS

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Objective: Currently, developing methods for the early diagnosis of osteoarthritis in patients is a priority. The aim: to compare the X ray changes caused by the injection of sodium monoiodoacetate (MIA) with those caused by synovial fluid of a patient with stage II osteoarthritis of the knee in an animal model. Material and Methods: 20 Wistar rats were divided into 4 groups. The control group (C) received 10 µl of sterile 0.9% NaCl solution (saline) in both knee joints. In group S, 10 µl of synovial fluid from a patient with stage II knee osteoarthritis were injected into the right knee joint, and 10 µl of saline into the left one. In group M, 10 µl of MIA solution at a dose of 2 mg per 10 µl were injected into the right knee joint, and 10 µl of saline into the left one. Animals from group MS received 10 µl of MIA solution into the right knee joint, and synovial fluid into the left knee joint. All animals underwent X-ray and histopathomorphological examination on days 10, 26, and 46. Results: The knee joint tissue in the control group remained intact according to X-ray data. The greatest changes were founded in the joints of rats administered MIA, with a noticeable progression of inflammatory and destructive processes from the 26th to the 46th day. Meanwhile, in rats administered synovial fluid, inflammatory changes were minimal on the 10th day. From the 26th day, edema appeared, narrowing of the joint space without changes in the subchondral bone. By the 46th day, the changes worsened and were comparable to those in rats administered MIA, but did not affect the subchondral bone. Conclusion: The maximum changes were observed in the tissues of the knee joints of rats with administration of MIA. Changes in the joints after the introduction of synovial fluid, developing by the end of the 4th week, lag behind in time and severity of those in the joints with the introduction of MIA. Further research is necessary to determine the nature of cellular infiltration and inflammatory reaction when introducing synovial fluid and MIA. Immunohistochemical and pathomorphological studies are currently underway.

P428

THE EFFECT OF ANTICONVULSANTS ON THE BONE SYSTEM

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Introduction. There have been several reports that chronic antiepileptic therapy is associated with abnormal bone and calcium metabolism, osteoporosis/osteomalacia, and increased fracture risk. Adverse bone effects of long-term antiepileptic therapy have been reported for more than four decades, but the exact molecular mechanism is still lacking. Several mechanisms have been proposed regarding the loss of bone mass induced by antiepileptic drugs: hypovitaminosis D, hyperparathyroidism, estrogen deficiency, and calcitonin deficiency.
Purpose: To study the effect of anticonvulsant drugs on bone density and women with epilepsy.
Methods: This study was performed at the multidisciplinary clinic of Tashkent Medical Academy in the period of 2021-2023. Thirty women of fertile age with epilepsy and 30 healthy control subjects participated in the study. Calcium, phosphorus, vitamin D, parathormone and alkaline phosphatase levels in blood serum were determined. Dual-energy X-ray absorptiometric scanning (DEXA) was also performed.
Results of the study: serum calcium, phosphorus and vitamin D levels were significantly lower, whereas serum parathormone and alkaline phosphatase levels were significantly higher in women with epilepsy compared to the control group. The data are summarized in Table 1. Bone mineral density (BMD) disorders were detected in 22 patients (73.4%). A statistically significant difference in DEXA scan measurements in different regions was found between patients with epilepsy and controls. Patients with epilepsy treated with antiepileptic enzyme inducer drugs (PEPs) had significantly lower serum values (calcium, phosphorus and vitamin D) and lower MPCT values compared to those treated with anticonvulsant liver enzyme inhibitor drugs. The MPCT results were positively correlated with serum calcium, phosphorus, and vitamin D, but negatively correlated with serum alkaline phosphatase and duration of therapy.
Conclusions: The results of our study showed that there are closely related and mechanisms between anticonvulsant drugs and bone density. These abnormalities may be mainly related to prolonged use of PEPs, especially liver enzyme inducers.
Keywords: epilepsy, bone diseases, women, ADS

P429

THE INVERTED J-SHAPED RELATIONSHIP BETWEEN SERUM URIC ACID LEVEL AND ABDOMINAL MUSCLE MASS IN KOREAN MALE POPULATION: A SINGLE-CENTER STUDY OF 5114 CASES

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Objective:
Sarcopenia, the age-related decline in muscle mass and strength, is influenced by oxidative stress and molecular inflammation, which disrupt the balance between protein synthesis and breakdown. Uric acid (UA), a compound with both antioxidant and pro-oxidant properties, may play a role in sarcopenia. However, previous studies examining the relationship between serum UA levels and sarcopenia have yielded inconsistent results. This study aimed to investigate the association between serum UA levels and abdominal muscle mass in Korean adult men.

Methods:
We analyzed data from 5114 men aged over 20 years who underwent laboratory tests and abdominopelvic computed tomography (apCT) as part of general health examinations from May 2014 to June 2019. Participants were divided into quartiles based on serum UA levels. Abdominal muscle areas, including low-attenuation muscle area (LAMA), normal-attenuation muscle area (NAMA), and total abdominal muscle area (TAMA), were quantified using cross-sectional apCT images at the L3 lumbar vertebrae. Between-group comparisons were conducted using Pearson's chi-square test for categorical variables and ANOVA for continuous variables. Trends between serum UA quartiles and abdominal muscle areas were analyzed using univariate (ANOVA) and multivariate (ANCOVA) models, adjusting for potential confounders.

Results:
The mean age of the participants was 52.5 ± 9.37 years, with a mean body mass index (BMI) of 24.6 ± 2.92 kg/m². In the univariate analysis, LAMA, NAMA and TAMA consistently increased across serum UA quartiles. However, after adjusting for potential confounding factors such as age, BMI, smoking status, hypertension, diabetes, dyslipidemia, glomerular filtration rate, and C-reactive protein, an inverted J-shaped relationship was observed. Specifically, NAMA and TAMA values peaked in the second quartile and gradually declined in the higher quartiles, while LAMA continued to increase across all quartiles (**Table**).

Conclusion:
These findings highlight that a specific range of serum uric acid levels may be linked to optimal abdominal muscle mass in Korean adult men. This inverted J-shaped relationship suggests that moderate uric acid levels could be protective, while both lower and higher levels may adversely affect muscle mass.

Table. Adjusted mean value of abdominal muscle mass by serum uric acid quartiles

variables	Uric acid				
	quartile 1 < 5.00 mg/dl (n = 1228)	**quartile 2 5.01 ~ 5.80 mg/dl (n = 1328)**	**quartile 3 5.81 ~ 6.70 mg/dl (n = 1251)**	**quartile 4 > 6.70 mg/dl (n = 1247)**	p-value
LAMA, cm^2	26.7 (26.285-27.200) [a]	26.7 (26.285-27.200) [b]	27.1 (26.654-27.557)	27.9 (27.441-28.372) [a,b]	0.003
NAMA, cm^2	133.2 (132.181-134.265) [a]	133.9 (132.932-134.927) [b]	132.9 (131.893-133.949) [c]	130.9 (129.795-131.915) [a,b,c]	< 0.001
TAMA, cm^2	158.4 (157.406-159.301)	159.2 (158.277-160.091) [a]	158.4 (157.488-159.358)	157.0 (156.033-157.962) [a]	0.015

Values are expressed as means (95% confidence interval). Multivariate analysis was performed with adjustment for age, body mass index, smoking status, hypertension, diabetes, dyslipidemia, glomerular filtration rate, and c-reactive protein. [a,b,c]: Same letters indicate statistically significant based on Bonferroni multiple comparsion Abbreviations: LAMA low-attenuation abdominal muscle area, NAMA normal-attenuation abdominal muscle area, TAMA total abdominal muscle area

P430

A PILOT STUDY ON NEUROTRANSMITTERS AND SARCOPENIA

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Background
Sarcopenia may affect neurotransmitter and hormone levels through central and peripheral nervous system. However, the relationship between sarcopenia and these markers has been scarcely studied. This study delineated the neurochemical changes and their response to therapeutic interventions in sarcopenic elders.

Method
This is a post-hoc analysis of a randomized controlled trial. We recruited 57 sarcopenic and 57 non-sarcopenic participants receiving health checkup from a district hospital in Taipei, Taiwan. Grip strength, walking speed and body composition were obtained to diagnose sarcopenia. The participants received a 12-week intervention involving resistance exercise and supplementation with branched-chain amino acids, calcium, and vitamin D3. Plasma adrenaline, noradrenaline, dopamine, serotonin, and cortisol were assessed using enzyme-linked immunosorbent assay (ELISA).

Results
Sarcopenic participants showed significantly lower levels of serotonin (p=0.002), adrenaline (p<0.001), and noradrenaline (p<0.001), with a trend toward reduced dopamine (p=0.053). Cortisol levels were similar between groups (p=0.503). Generalized estimating equations, adjusted for age and gender, showed sarcopenia was linked to reduced serotonin, adrenaline, and noradrenaline, while the intervention raised noradrenaline levels (p=0.001).

Conclusion
Lower plasma serotonin, adrenaline, and noradrenaline levels were noted in elders having sarcopenia, compared with sex and age matched non-sarcopenic controls. Exercise and nutritional interventions increased noradrenaline in sarcopenic elders. Future studies are needed to evaluate the causal relationship between plasma neurotransmitters and sarcopenia.

P431

COMPARISON OF THE CLINICAL PICTURE OF HIP JOINT DAMAGE WITH THE RESULTS OF RADIOGRAPHIC EXAMINATION IN PATIENTS WITH AXIAL SPONDYLOARTHRITIS

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Introduction. Inflammatory lesion of the hip joints (HJ) (coxitis) is one of the main factors of early disability of patients with axial spondylitis (axSpA). Objective. To compare the dynamics of clinical manifestations of coxitis with X-ray data of the HJ in patients with axSpA. Material and methods. The analysis included 62 patients diagnosed with axSpA (according to the ASAS 2009 criterion), observed for at least 2 years. The diagnosis of coxitis was established on the basis of clinical signs such as pain in the groin area and / or limitation of movement in the HJ. The average age of 62 patients was 29.2 ± 6.4 years with an average duration of the disease of 23.8 ± 16.2 months, 92% of patients were positive for HLA-B27. Results: Clinical signs of coxitis were detected at the beginning of the observation in 35 (56%) of 62, and after 2 years of active observation - in 13 (21%). At inclusion in the study, out of 62 patients, radiographic coxitis was detected in 1 (2%) patient (BASRI hip ³2). During the observation period, the number of patients with radiographic coxitis was 13 (21%), and radiographic progression in the hip joint was detected in 23 (37%) patients. Initially, out of 35 patients who noted pain in the hip joint, radiographic progression of coxitis was detected in 16 over 24 months, and after a year of observation, pain in the hip joint persisted in only 7, and after 24 months, pain was noted in only 4 of them. Of the 27 patients who did not experience pain in the hip joint at the time of inclusion, development and progression of coxitis was radiographically detected in 7. Conclusion: Clinical signs of hip joint damage are detected in 50% of patients with early axSpA. Pain syndrome in the hip joint in axSpA is accompanied by radiographic progression only in half of the cases, and in 12% it was asymptomatic.

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EFFECTIVENESS AND SATISFACTION OF AN EXERCISE-BASED TELEREHABILITATION PROGRAMME: PILOT TESTING ACROSS WOMEN WITH DIASTASIS RECTUS ABDOMINIS

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Objective. Exercise-based telerehabilitation is suggested as an alternative means of rehabilitation when face-to-face interventions are deemed difficult. However, its effectiveness remains questionable. This pilot's objective investigated the effectiveness, satisfaction and compliance of implementing an exercise-based program via telerehabilitation in postpartum women with diastasis rectus abdominis (DRA), representing a group with barriers in attending face-to-face interventions.
Materials and Methods. Sample comprised 18-50 year-old women with established postpartum DRA (>6 months) and familiarity in using electronic media. Telerehabilitation included a 12-week exercise program, delivered 3-times weekly via two synchronous teleconference sessions (monitoring-supervision in real time by a physiotherapist) and one asynchronous one (electronic platfom-based video recorded sessions). Program comprised progressive retraining exercises of deep abdominals (core), pelvic floor muscles, trunk strengthening and combinations with progressive load functional retraining exercises. Outcomes (assessed pre- and post-intervention), included a) patient satisfaction, using the Telehealth Usability Questionnaire (TUQ_Greek), b) inter-recti distance (IRD), the distance/width between the rectus abdominis muscles assessed by real-time 2D diagnostic ultrasound, c) trunk muscle endurance tests (plank and McGill's trunk flexor endurance), d) body image assessed with Body Image States Scale (BISS_Greek) and e) patient compliance assessed through a detailed exercise diary. Analysis was performed with SPSS.
Results. Thirteen DRA women (37.54±5.49 years) enrolled and completed the pilot. Telerehabilitation appeared satisfactory for 84.62% of women. Overall mean score in TUQ_Greek was high (6.28±0.60), particularly due to the ease of use of the system, women's satisfaction on its usefulness, quality of interface and satisfactory therapist interaction (synchronous mode). IRD yielded statistically significant decreases at 3-months ($p<0.05$). Post-intervention, front plank tests had non-statistically significant improvements, whereas, significant improvements in side plank ($p=0.028$-0.029) and McGill's trunk flexor endurance tests ($p=0.023$) were observed. Body image improved at 3 months ($p = 0.023$), whistle exercise compliance was highly maintained (70.51%).
Conclusions: The 12-week exercise-based telerehabilitation program for DRA was considered effective and satisfactory, demonstrating high compliance. Significant improvements were also recorded in clinical measures; IRD decreased, core endurance increased and body image improved. Overall, telerehabilitation

appears to be a promising approach to be integrated into clinical practice, particularly across patient samples with difficulties for in-person attendances.

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FRACTURE RISK ASSESSMENT (FRAX) VARIATIONS IN ELDERLY WOMEN BASED ON TIME-UP-AND-GO TEST PERFORMANCE

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Objective: Fracture Risk Assessment Tool (FRAX) is commonly used to estimate the probability of fractures. Functional mobility, as assessed by the Time-Up-and-Go (TUG) test, has been closely associated with fall risk. This study aims to investigate the relationship between TUG test performance and FRAX-calculated fracture risk.

Material and Methods: The study assessed the relationship between TUG test performance and FRAX-calculated fracture risk in 70 women aged 60 years or older. Participants were categorized into four groups based on TUG performance recorded in seconds (s): TUG < 10 s, TUG = 11–20 s, TUG = 21–29 s, and TUG ≥ 30 s. FRAX scores, estimating 10-year probabilities of major osteoporotic fractures (MOF) and hip fractures (HF) were calculated for each participant. Data collection and transfer from the electronic health record was performed with an innovative JAVA tool, developed by Kirilov et al. (1,2)

Results: Out of 70 participants, 32 women (45.7%) had TUG < 10 s, 24 women (34.3%) had TUG = 11–20 s, 9 women (12.9%) had TUG = 21–29 s and 5 women (7.1%) had TUG ≥ 30 s. The mean age of the participants was 70 ± 7.1 years, and the mean BMI was 29.6 ± 5.6 kg/m². FRAX scores for MOF differed significantly ($p < .001$) across TUG groups. Participants with the poorest TUG performance had the highest mean FRAX score for MOF (24.96%), compared to those with the best performance (14.75%). Similarly, FRAX scores for HF also showed significant differences ($p < .001$) among TUG groups. Women with the poorest TUG performance had the highest mean FRAX score for HF (11.83%) compared to those with the best performance (3.42%).

Conclusion: These findings underscore the importance of incorporating functional mobility assessments into fracture risk evaluations, as reduced mobility is strongly associated with higher fracture susceptibility.

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P434

FREQUENTLY REPORTED BLOOD BIOMARKERS IN SARCOPENIA CLINICAL TRIALS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Objectives: This systematic review and meta-analysis aims to identify most frequently reported blood-based biomarkers (BB) in randomised clinical trials (RCTs) addressing sarcopenia management, as well as to evaluate the effects of sarcopenia-specific interventions on their concentrations.

Material and Methods: Electronic databases were searched via Ovid (MEDLINE, Embase and Cochrane Central Register of Controlled Trials) to retrieve RCTs published until October 2024 with any type of intervention (dietary, physical, pharmacological and combined or other) on sarcopenic participants. Only studies including participants aged ≥ 60 years old (or mean age ≥ 60 years old) with sarcopenia defined by a measurement of at least two key parameters of sarcopenia (e.g., muscle/lean mass and muscle strength or physical function) and reporting BB values pre- and post-intervention were included. Study selection and data extraction were performed by two independent reviewers. Meta-analyses were performed for BB reported in minimum 2 RCTs using a random effect model with a standardised mean difference (SMD) and a 95% confidence interval (CI) as effect size.

Results: On the 3985 references identified by the literature search, 21 RCTs measuring BB in individuals with sarcopenia matched the inclusion criteria and were selected. The most frequently reported BB were CRP (8/21 RCTs), IL6 (7/21 RCTs), TNFα (6/21 RCTs), 25-OH-Vitamine D (6/21 RCTs), IGF-1 and Albumin (5/21 RCTs) with ≥5 RCTs measuring these biomarkers. ALAT, Cholesterol, Creatinine, IL-10 (3/21 RCTs each) and fasting blood glucose (4 RCTs) were reported in 3 to 4 RCTs. Finally, ASAT, Calcium, Follistatin, GDF-15, GDF-8, HDL, LDL, IL1Ra, IL-8, Insulin, Triglycerides and CAF were assessed in 2 RCTs. Among the most frequently re-

ported BB, only IGF-1 (SMD=0.43, CI= [0.05; 0.80]) and 25-OH-Vitamin D (SMD=0.92, CI= [0.27; 1.57]) were significantly impacted by the studied interventions.
Conclusion: Despite the large heterogeneity of BB measured in sarcopenia-specific RCTs, only a limited number of them are muscle-specific. In addition, few BB seemed impacted by the proposed interventions. Therefore, there is an urgent need to use available recommendations on biomarkers specific to sarcopenia and to develop a Core Outcome Set for sarcopenia intervention studies aiming at a better standardisation of the management of this disease.

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CHARACTERIZATION OF TRIVALENTLY CROSSLINKED C-TERMINAL TELOPEPTIDE OF TYPE I COLLAGEN (CTX) SPECIES IN HUMAN PLASMA AND SERUM USING HIGH-RESOLUTION MASS SPECTROMETRY

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Objectives : With an aging population, the increased interest in the monitoring of skeletal diseases such as osteoporosis led to significant progress in the discovery and measurement of bone turnover biomarkers since the 2000s. Multiple markers derived from type I collagen, such as CTX, NTX, PINP, and ICTP, have been developed. Extensive efforts have been devoted to characterizing these molecules; however, their complex crosslinked structures have posed significant analytical challenges, and to date, these biomarkers remain poorly characterized. In this work, we aimed at characterizing circulating CTX.
Material and method : We extracted and characterized type I collagen peptides directly from human plasma and serum using a proteomics workflow that integrates preparative LC, affinity chromatography, and HR-MS.
Results : Thanks to this workflow, 44 species of CTX were extracted and characterized.
Conclusion : We successfully characterized plasma CTX species.

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COMPARATIVE ANALYSIS OF BALP MEASUREMENT: IMMUNOASSAY AND ELECTROPHORESIS

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Objectives: Bone alkaline phosphatase (BALP) is one of the recommended biomarker for assessing bone fragility in Chronic Kidney Disease (CKD) patients[1]. This study aims to compare immunoassay and electrophoresis techniques for the quantification of BALP.
Materiel and Methods: Remnants clinical samples were collected from 78 dialysis patients. Serum BALP was measured using TECO Diagnostic immunoenzymatic (ELISA) technology (Anaheim, US) and by electrophoresis. Agreement between the methods was assessed using Passing-Bablok regression and Spearman's correlation coefficient. Proportional and constant biases were evaluated respectively from the regression slopes and Bland-Altman analysis.
Results: Median (IQR) BALP concentration was 48.1 U/L (37.0–74.8) using the TECO Diagnostics kit and 32.5 U/L (21.9–52.2) with electrophoresis. A significant correlation was found between the two methods (Spearman's r=0.85, p<0.0001), but analysis revealed a significant negative constant bias (-41.9%) and a non-significant positive proportional bias (+28%). Passing-Bablok regression is shown in **Figure 1**.
Conclusion: Although the correlation between the two methods was statistically significant, the observed biases indicate that the methods are not clinically interchangeable. These findings underscore the need for careful consideration when interpreting BALP concentrations obtained using different analytical approaches and pave the way for further comparisons of electrophoresis with other immunoassays.
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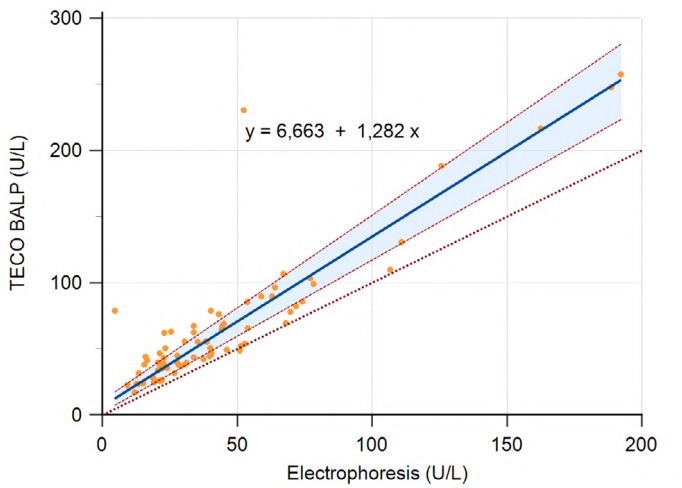

Fig. 1 Methods comparison graphs showing serum BALP results by TECO Diagnostic and electrophoresis.

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EXPRESSION OF BONE REMODELING MARKERS IN RA PATIENTS

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Background: Rheumatoid arthritis (RA) is a chronic systemic disorder characterized by progressive destructive arthritis and other organ involvement. Secondary osteoporosis and high risk of fragility fractures are common for RA patients. This phenomenon is still being studied especially the role of inflammation as a mediator of bone resorption.
Objectives: To evaluate the concentration of some bone metabolism markers as a function of the level of RA disease activity.
Material and methods: 81 females with RA, confirmed according to ACR-EULAR 2010 criteria, aged from 28 to 83 years were included into the study. Patients received no more than 4 mg/per day of methylprednisolone during last year and were naive to biological treatment. We calculated disease activity score by DAS-28 CRP, evaluated RA laboratory immunological markers (FR, anti-CCP), levels of selected bone metabolism markers (osteocalcin, sRANKL, osteoprotegerine).
Results: All the patients were divided into 3 groups as a function of DAS28 CRP low, medium and high disease activity (LDA, MDA, HDA) (<3,2, 3,2 -5,1, >5,1). Osteocalcin levels were significantly higher in the LDA group compared to the MDA and HDA groups (12,3 ± 1,12 pg/mL vs. 4,66 ± 0,25 pg/mL and vs 2,52 ± 0,29 pg/mL, p<0,001 and p<0,05, respectively). A statistically significant difference was also observed between the levels of sRANKL and OPG in the groups. For sRANKL the level in LDA group constituted 682,3 ±438,3 pmol/L, for MDA 892,4 ±658,7 pmol/L and for HAD 1062,4 ±846,8 pmol/L, p<0,05 and p<0,001, respectively). LDA was associated with higher OPG level, 121,2±83,3 pg/mL vs 111,4±82,7 pg/mL. A correlational analysis showed a strong positive correlation of sRANKL level and high RA activity, (r=0,48, p<0,001) and well its moderate positive correlation with antiCCP level, (r=0,32, p<0,05).
Conclusions: Patients with RA have significant changes in bone metabolism. A high-level inflammatory process favors the increase of markers of bone resorption and decrease of markers of bone formation in RA patients. Reduced levels of osteocalcin in higher disease activity groups may show a low bone formation due to chronic high-level inflammation and strong immune response.

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BONE REMODELING MARKERS AND CAROTID ATHEROSCLEROSIS IN RA PATIENTS

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Background: RA patients have an accelerated progression of atherosclerosis as well as the risk of secondary osteoporosis, associated with changes in bone turnover.
Objectives: To evaluate intima/media thickness at a. carotis in correlation with the concentration of some bone metabolism markers in RA patients.
Materials and methods: We examined 81 women with RA and 55 women without RA, as a control group, compatible by age and exclusion criteria. Anamnestic and clinical data were collected according to the questionnaire developed for the study, which includes the history of the disease, life, objective data. Patients with type 2 diabetes mellitus, oncological pathology, other inflammatory diseases, decompensated somatic, pregnant, treated with statins or biological preparations were excluded. DAS-28-CRP (C-reactive protein), rheumatoid factor, anti-CCP antibodies, selected bone metabolism markers (osteocalcin, sRANKL, osteoprotegerine) and IMT index on the carotid artery were evaluated.
Results: The mean age of the patients included in the study was 58.12±5.43 years with a mean disease duration of 10.8±3.4 years. Methylprednisolone of 4 mg per day during last year was accepted. Significant differences were identified compared to the control group for the mean IMT value (0.97±0.13 mm vs 0.85±0.09 mm, p<0.05). Mean osteocalcin level for RA group made 6.49 ±0.92 vs 11.4±1.05 pg/ml in controls, p<0.001. Mean sRANKL level in RA patients was 1028.4±1236.3 pmol/l and OPG level was 108.6±78.4 pg/ml with significant difference with control group. Increased carotid artery IMT correlated with RA duration (r=0.48, p<0.001), disease activity measured by DAS28-CRP (r=0.52, p<0.001), anti-CCP antibody levels (r=0.31, p<0.05). We found a moderate positive correlation of sRANKL level with IMT in studied group of patients (r=0.32, p<0.05) and sRANKL and DAS28-CRP (r=0.34, p<0.05).
Conclusions: In women with RA, a significant increase in carotid artery IMT was found. Increase in IMT correlated positively with increase in bone resorption markers, disease duration and activity and the presence of anti-CCP antibodies. This shows common pathogenetic background of atherosclerosis and bone resorption with management possibilities.

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THE ECONOMIC IMPACT OF PERIPROSTHETIC KNEE FRACTURES

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Objective
The purpose of this study is to describe the inpatient costs of periprosthetic fractures of the knee in a Spanish hospital system.
Material and Methods
We conducted a retrospective study of periprosthetic fractures of the knee that were admitted to a single trauma unit between 2017 and 2022. All patients with a periprosthetic knee fracture involving the distal femur who underwent surgery were included. Data from the hospital inpatient database and finance department was utilized for cost analysis. Demographics, length of stay, laboratory and radiology tests, hospital stay and surgical implants cost were collated. An analysis of direct inpatient costs was performed.
Results
34 patients met the inclusion criteria for review. The mean age was 77 years and 94% were female. 28 patients underwent osteosynthesis surgery and 6 patients had revision arthroplasty, with a mean length of stay of 9.92 days and 10.33 days, respectively. The mean direct inpatient cost was €5.800. The mean cost for a full revision arthroplasty treatment was over €10.600 compared to €4.500 for osteosynthesis treatment. Variables with highest economic impact were surgical implants (52%) and hospital length of stay (36%).
Conclusion
Periprosthetic knee fractures create a significant economic burden on healthcare systems. The prolonged length of stay associated with fractures requiring revision implants leads to increased costs to the healthcare service. As we can expect an increasing incidence of periprosthetic fractures presenting in the coming years, it is paramount that we establish fracture prevention protocols and minimize time until surgery and postoperative recovery stay to reduce the economic impact.

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XANTHINE OXIDOREDUCTASE ACTIVITY IN BLOOD: DISCOID LUPUS ERYTHEMATOSUS VERSUS SYSTEMIC LUPUS ERYTHEMATOSUS

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Background. Discoid lupus erythematosus (DLE) is the most common type of chronic cutaneous LE. Unlike systemic lupus erythematosus (SLE), the disease is characterized by the absence of internal organs damages and antinuclear antibodies in most patients. Oxidative stress is involved in the development of both diseases. Xanthine oxidoreductase (XOR) enzyme system is an important source of reactive oxygen and nitrogen species.
Objective: to reveal the features of two forms of XOR (xanthine dehydrogenase (XDG; EC 1.17.1.4) and xanthine oxidase (XO; EC 1.17.3.2)) in plasma and lysed RBC of DLE and SLE patients.
Methods. 56 patients with verified SLE, 31 patients with verified DLE and 35 apparently healthy volunteers were analyzed in the study. The SLEDAI 2K index was used to assess SLE activity. The enzymes activities were determined by previously described methods [1].
Results. In contrast to the control, XO activity was higher and XDG activity was lower in plasma of DLE patients. Activities of both XOR forms in lysed RBC did not differ from the norm in this group. Activity of XO was lower in plasma from DLE patients in comparison with the subgroups with low, moderate and high SLE activity. XDG activity in plasma and XO activity in lysed RBC of DLE patients were lower than in low activity SLE, but higher than in the subgroups with moderate and high disease activity. XDG activity of lysed RBC in DLE was higher than in patients with low and moderate SLE activities, but lower than in patients with high diseases activity. The increase in SLE activity was accompanied by the decrease in the ratio of XO/XDG levels in RBC lysates.
Conclusion. SLE differs from DLE by a more pronounced imbalance of oxidase and dehydrogenase activities of blood XOR. These metabolic changes contribute to the development of pathology.
SLE and DLE are characterized by some common changes in XO and XDG activities. At the same time, XOR blood profiles have distinctive features, which are characteristic for each nosology.
Reference:
1. Mozgovaya E.E. et al. Siberian Journal of Life Sciences and Agriculture 2021;3:288-304.

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FEATURES OF BLOOD XANTHINE OXIDOREDUCTASE ACTIVITY PROFILES IN SYSTEMIC LUPUS ERYTHEMATOSUS AND RHEUMATOID ARTHRITIS

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Objective: Systemic lupus erythematosus (SLE) and rheumatoid arthritis (RA) are belonged to a large group of rheumatic diseases. According to modern concepts, the pathogenesis of these diseases is based on both immunopathological mechanisms and metabolic disorders developing at the cellular and subcellular levels. We aimed to evaluate the changes in xanthin oxidoreductase (XOR) interconvertible forms (xanthine oxidase ((XO), EC 1.17.3.2) and xanthine dehydrogenase ((XDG), EC 1.17.1.4)) activities in plasma and lysed blood cells (WBC and RBC) of SLE and RA patients.

Methods: Diagnosis of SLE was verified using the SLICC criteria (2012), RA – ACR/EULAR criteria (2010). Activities of XO and XDG were measured by spectrophotometric methods [1]. The enzymatic activities were expressed as nmol/min/ml and normalized to 1×10^7 cells/ml in WBC, to 1×10^9 cells/ml in RBC. Statistical comparison tests were selected in according to common guidelines. Differences were considered significant when $p<0.05$.

Results: 56 adult SLE patients, 77 adult RA patients and 35 healthy individuals (control group) were enrolled in the study. In contrast to control, increased XO_{pl} activity and decreased activities of XO_{WBC}, XDG_{pl}, XDG_{WBC}, XDG_{RBC} ($p<0.001$ for all enzymes) were observed in SLE and RA. XO_{RBC} activity was increased in RA ($p<0.001$) and did not differ from the norm in SLE. XO_{RBG} and XDG_{pl} activities were higher ($p<0.001$ and $p=0.012$, respectively), XO_{WBC} and XDG_{RBC} activities were lower ($p<0.001$ for both enzymes) in RA compared to SLE. The XO_{WBC}/XDG_{WBC} coefficient with SLE was higher than with RA ($p<0.05$). The XO_{RBC}/XDG_{RBC} coefficient with SLE was lower than with RA ($p<0.05$). The XO_{pl}/XDG_{pl} coefficient was higher in SLE and RA than in healthy individuals ($p<0.05$).

Conclusion: SLE and RA are characterized by unidirectional changes in the activities of the oxidase and dehydrogenase XOR forms in plasma, lysed WBC and RBC. The balance of XO_{pl} and XDG_{pl} indicates an intensification of free radical oxidation reactions in both diseases. Free radicals formed as a result of XOR activities can probably have a damaging effect and participate in processes that determine the duration of blood cells life.

References:

1. Mozgovaya E.E. et al. Siberian Journal of Life Sciences and Agriculture 2021;3:288-304.

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COULD A BODY SHAPE INDEX (ABSI) PREDICT OSTEOPOROSIS IN OLDER ADULTS LIVING WITH OBESITY?

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Objective: Osteoporosis is a disease characterized by decreased bone mineral density and increased risk of fractures in older adults. While previous studies have used traditional anthropometric measurements for risk assessment, newer indices such as A Body Shape Index (ABSI) may provide additional information. In our study, we aimed to investigate the relationship between ABSI and osteoporosis in older adults living with obesity.

Material and Methods: 203 patients were enrolled to this study who admitted to the geriatric outpatient clinic of a university hospital, and all of them underwent comprehensive geriatric evaluation. Anthropometric measurements, assessment of physical performance were performed and all patients included in the study were obese with a body mass index (BMI) $\geq$ 30 kg/m^2. ABSI was calculated by dividing waist circumference(WC) by BMI $^{2/3}$ × height $^{1/2}$ (WC/height $^{1/2}$x BMI $^{2/3}$). Patients were divided into two groups as those with and without osteoporosis and evaluated for osteoporosis by dual-energy X-ray absorptiometry (DEXA) with BMD measurement and T-scores; and for fractures, by simultaneous frontal and lateral thoracolumbar radiography. Patients with a T score $\leq$ -2.5 and/or a vertebral fracture on radiography were diagnosed with osteoporosis.

Results: Demographic and clinical characteristics revealed strong gender-specific patterns, with females showing significantly higher osteoporosis ($p<0.001$) in **Table-1**. Waist-hip ratio (WHR) measurements showed significant differences between groups (0.84 vs 0.81, $p=0.043$), suggesting a potential relationship between body fat distribution and osteoporosis. ABSI showed positive correlation with WHR (r=0,577) and negative correlation with BMI (r=-0.307). The mean ABSI values were lower in the osteoporotic group (0.08403) compared to the non-osteoporotic group (0.08468) in **Figure-1**. Independent T-test analysis confirmed these differences were statistically significant (p=0.029). According to ROC analysis, the cut-off value for ABSI was 0.80755. This value was found to increase the risk of osteoporosis by 2.4 times when adjusted for gender and diabetes (p=0.015, 95% CI: 1,188-5.011).

Conclusion: The results suggest that high ABSI may potentially be associated with a higher risk of developing osteoporosis. This highlights the importance of assessing body fat distribution in preventing osteoporosis and may suggest the use of ABSI as a valuable marker for early intervention.

Disclosure of Interest: None Declared

Key words: a body shape index (ABSI), osteoporosis, older adults, obesity

Table-1: Baseline characteristics of the patients

Parameters	Group with Osteoporosis (n=63)	Group without Osteoporosis (n=140)	P value
Age	73 ±5.7	73 ±5.6	0.391
Sex, female male	59 (93.75%) 4 (6.25%)	90 (64.3%) 50(35.7%)	**<0.001**
CFS	4 (3-4)	4(3-5)	0.054
Comorbidities Diabetes mellitus Hypertension Coronary artery disease	 31(49.2%) 54(85.7%) 15(23.8%)	 87(62.1%) 115(82.1%) 43(30.7%)	 0.084 0.685 0.401
Screening tests Katz ADL Lawton IADL MMSE Yesavage GDS MNA-SF SARC-F	 6(5-6) 8(7-8) 27(24-29) 3 (1-7) 10(7-12) 4(3-5)	 6(6-6) 8(7-8) 27(24-29) 2(0-5) 12(9-14) 4(3-4)	 0.723 0.131 0.831 **0.035** 0.550 **0.011**
Handgrip strength test 5 times sit to stand test	17.8(14-20.6) 14.6(12-16.7)	20.4(15-27.1) 15(12.5-18.7)	**0.005** 0.544
BMI (kg/m^2)	33.46(31.65-37.34)	32.81(31.52-37.82)	0.387

Data were expressed as n (%) or median [interquartile range], unless otherwise indicated
Data were expressed as n ± STD or mean, unless otherwise indicated
CFS, clinical frailty score; ADL, activities of daily living; IADL, instrumental activities of daily living; MNA-SF, Mini Nutritional Assessment- Short Form; MMSE-Mini-Mental State Examination; GDS, geriatric depression scale, SARC-F, A Simple Questionnaire To Rapidly Diagnose Sarcopenia; BMI, body mass index.

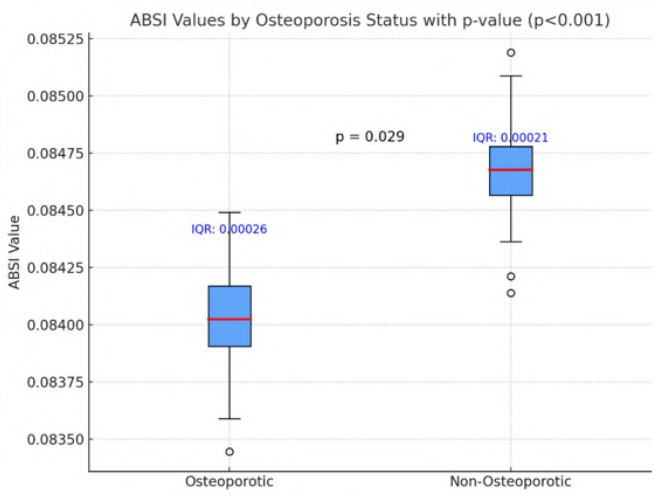

Figure-1: ABSI Values by Gender and Osteoporosis Status

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MULTICENTRIC CARPAL-TARSAL OSTEOLYSIS (MCTO)

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Introduction:MCTO is rare syndrome characterized by progressive bone loss, usually in the carpal and tarsal bones, resulting in deformity and disability. In many cases they associate with chronic renal failure, intellectual deficits and facial abnormalities.
Case description:Our patient developed normally until the age of 2 ys. His illness began with pain and swelling in hand and wrist, and a year later in the hip joint, which soon led to camptodactyly and limited movement. Against nonsteroid, steroid and MTX treatment, the disease continued to progress, affecting the elbow join. Laboratory tests, virus serology, immunology, HLAB27 tests gave normal results. Cardiologic and ophthalmologic findings didn't detect deviations. Joint US images showed inflammatory abnormalities (tenosynovitis). On X-ray, the development of the bones was 5 years younger than chronological age, they were porotic, the cortical bones were sharply defined, and the epiphysis nuclei were irregular. ODM described reduced bone mineral content, bone markers confirmed increased bone turnover. The first initial genetic examination ruled out metabolic disease or mucopolysaccharidosis, and juvenile rheumatoid arthritis was suspected. An extended genetic examination gave the diagnosis of Multicentric Carpal-Tarsal Osteolysis (MCTO). This disease is the mutation of the MAFB gene, which is a negative regulator of the receptor activator of the nuclear factor-KB ligand (RANKL). Due to progression, a biological therapy has been initiated. The use of denosumab, an inhibitor of the RANKL, provides the possibility of treating the cause.
Conclusion:MCTO is a particularly rare disease, the symptoms of which correspond to inflammatory joint disease. For diseases that do not or barely respond to treatment, genetic testing can provide the diagnosis and direction of treatment. Recently, genetic advances have led to a better understanding of the biological basis of rare bone diseases and a new therapeutic perspective.

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AXIAL SPONDYLOARTHRITIS IN MEN AND WOMEN

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Objective: To optimize therapy in pts we have studied a gender differences in disease activity in pts with axial spondyloarthritis (axSpA).
Material and methods: A total of 108 pts who met the ASAS (2009) or modified New York criteria (1984) were included. There were 62 men (57.4%) and 46 women (42.6%).
Results: Ankylosing spondylitis was diagnosed in 67.2% of women and 88.5% of men. The remaining pts were diagnosed with non-radiographic axSpA. HLA B27 was detected in 78.3% women and 88.7% men. Women were more often diagnosed with arthritis than men (80.4% vs 62.9%, p=0.05) and dactylitis (32.6% vs12.9%, p=0.01), respectively. The results concerning the assessment of axSpA activity are presented in a Table.

Table. Disease activity assessment

Manifestation	Women, Me(Q1;Q3)	Men, Me(Q1;Q3)	p
BASDAI	5.3(3.7;6.6)	3.9(2.8;5.6)	0.02
ASDAS CRP	2.42 (1.7;3.6)	2.2(1.4;3.1)	0.6
BASFI	1.3(0.4;6.4)	1.9(0.2;4.7)	0.5
Numeric pain rating scale	5.5(4.0;7.0)	4.0(1.8;7.0)	0.01
Night back pain	6.0(3.0;7.25)	3.0(1.0;5.0)	0.1
Back pain during the day	5.0(3.3;6.0)	4.0(1.0;6.0)	0.04
Global assessment of general well-being	5.0(4.0;7.0)	4.0(3.0;5.8)	0.002
ESR according to Westergren, mm/h	16(8.0;30.0)	8.0(2.0;28.8)	0.06
CRP, mg/l	2.7(0.8;5.4)	4.6(1.2;10.0)	0.03
BASDAI components			
Fatigue	6.0(3.0;7.2)	4.0(3.0;7.0)	0.08
Back pain	6.5(4.0;8.0)	5.0(3.0;7.0)	0.02
Joint pain	3.0(1.0;6.0)	3.0(0.0;0.5)	0.1
Enthesis pain	4.0(2.0;7.0)	3.0(1.0;5.0)	0.03
Morning stiffness severity	5.0(3.0;8.0)	4.0(2.0;7.0)	0.1
Duration of morning stiffness	4.0(1.0;6.0)	3.0(2.0; 6.0)	0.7

According to the HADS, women had a higher anxiety level than men - 9(6;10) and 5(2;8) (p=0.01), respectively. Depression rates did not differ between the groups.
Conclusions: Arthritis and dactylitis was observed in women more often than in men. Men were more often positivity for HLA B27 and laboratory activity was also higher. But the BASDAI, the numerical pain rating scale, back pain during the day and a global assessment of general well-being in women were higher. Women also had significantly higher indicators of the hospital anxiety assessment scale, which may affect the perception and assessment of pain. A gender-based approach to assessing disease activity in clinical practice may contribute to the development of personalized treatment for pts.

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DO MODERN GLUCOSE MEASUREMENT AND INSULIN DELIVERY METHODS PRESERVE BONE HEALTH IN PATIENTS WITH TYPE 1 DIABETES?

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Objective: Type 1 diabetes (T1D) can negatively affect bone metabolism and lead to deteriorated bonequality and architecture. This study evaluated bone metabolism in adult T1D patients on different insulin delivery and glucose measurement modalities.
Materials and Methods: 170 adult patients with T1D, who were either on multiple daily insulin regimens (MDIR) or on continuous subcutaneous insulin infusion (CSII) systems were retrospectively studied. Bone mass density (BMD) at femur neck (FN) and lumbar spine (LS) and trabecular bone score (TBS) were estimated. Medical therapy affecting bone metabolism was exclusion criteria.
Results: 94 patients were on MDIR and 76 were being treated with CSII systems. No differences were observed for mean age and BMI among the 2 groups. CSII patients needed markedly lower total daily insulin doses (41.1
Objective: Type 1 diabetes (T1D) can negatively affect bone metabolism and lead to deteriorated bonequality and architecture. This study evaluated bone metabolism in adult T1D patients on different insulin delivery and glucose measurement modalities.
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Results: 94 patients were on MDIR and 76 were being treated with CSII systems. No differences were observed for mean age and BMI among the 2 groups. CSII patients needed markedly lower total daily insulin doses (41.1±13.6 vs 46.3±13.3 IU, p= 0.006) and achieved significantly
lower mean HbA1c levels (7.55 ± 0.71 vs 7.82 ±0.76%, p= 0.019) in comparison to the MDIR ones. Furthermore, patients with CSII presented with higher mean BMD (0.89 ± 0.14 vs 0.87 ±0.15, p= 0.011) and T-Score values (-0.88 ± 1.1 vs -0.93 ± 0.92, p < 0.01) at FN compared to the MDIR patients. The same observation occurred for both BMD (0.97 ±0.14 vs 0.93 ±0.17, p= 0.004) and T-Score (- 0.95 ± 1.0 vs -0.99 ±1.3, p < 0.01) at LS. Moreover, TBS was markedly higher in the CSII group (1.38 ± 0.16 vs 1.33 ±0.11, p= 0.002). Finally, in both groups, HbA1c was a negative and BMI and age were positive prognostic factors for TBS.
Conclusions Bone mineral density, architecture and strength of patients with T1D could potentially profit from the implementation of modern technology regarding glucose measurement and insulin delivery.
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Conclusions Bone mineral density, architecture and strength of patients with T1D could potentially profit from the implementation of modern technology regarding glucose measurement and insulin delivery.

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YEARS OF LIFE LOST DUE TO OSTEOPOROTIC HIP FRACTURES IN ECUADORIAN OLDER ADULTS

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Hip fracture is an important public health challenge, worldwide: however there is no updated and comprehensive assessment of the burden of hip fracture in older adults in Latin America. The burden of hip fracture (HF) expressed as years of life lost (YLL) has not been studied in older adults in Ecuador.
Aim: To analyze years of life lost (YLLs) due to hip fracture (HF), with data from the Global Burden of Disease (GBD).
Materials and methods: In this is cross-sectional study, we examined the years of life lost due to hip fractures in older adults (60 years and older) of both sexes stratified by five-year periods. Data from patients who suffered a hip fracture (ICD-10: S720–S722) during 2019 from the hospital discharge yearbook published by the National Institute of Statistics and Census INEC, Ecuador, were used. To obtain the years of life lost, the standard life expectancy (SLE) of the Global Health Estimates (GHEs) published by the WHO was used. To calculate the crude (YLL rate) and age standardized (ASYR) rates, the world standard population published by the WHO-GBD was used.
Results: The number of deaths and years of life lost (absolute number) due to hip fractures in 2019 increased with age. The crude rate of years of life lost (YLL rate) and the age-standardized rate (ASYR) decreased in the older age groups. The main results are presented in Table 1.

Table 1. Premature mortality from hip fracture in older adults in Ecuador, 2019

Age group	Deaths	Population	SLE	YLL*	YLL rate	ASYR
60-64	0	161	30.3	0.0	0	0.00
65-69	4	224	25.5	102	45,518	1,347
70-74	7	329	20.8	145	44,191	977
75-79	12	472	16.4	197	41,771	635
80-84	23	666	12.5	288	43,203	393
85+	52	1,473	7.6	395	26,830	169
Total	98	3,325		1,127	201,513	3,521

SLE, Standard life expectancy; YLL, years of life lost (*absolute number); ASYR, Age Standard year rate.

Conclusion: The burden of years of life lost related to fragility fractures is high. Although the absolute number of deaths is greater in older individuals, the proportional impact is greater in younger individuals. Fracture prevention and risk management in younger age groups would have a significant impact on reducing the number of years of life lost and improving public health.

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POTENTIAL YEARS OF LIFE LOST FROM OSTEOPOROTIC FRACTURES IN ECUADOR

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In the world population, the number and incidence of hip fractures (HF) have increased in recent decades due to an increase in the population at risk and a change in the specific incidence in different age and sex groups. As a result, the burden of hip fracture on national health care systems is of great concern on a global scale. Potential years of life lost (PYLL) due to hip fractures have not been studied in older adults in Ecuador.
Objective: To analyze the potential years of life lost due to hip fractures at the national level.
Materials and Methods: In this cross-sectional study, we examined the potential years of life lost due to hip fractures in older adults (60 years and older) of both sexes stratified by five-year age groups. We used data on individuals who suffered a hip fracture (ICD 10: S720-S722) in 2019, from the hospital discharge yearbook published by the National Institute of Statistics and Census of Ecuador (INEC). We calculate the potential years of life lost for each age group by multiplying the number of deaths by the remaining years of life lost.
Results: The number of hip fracture deaths in 2019 increased with increasing age. Potential years of life lost increased in younger age groups, but decreased in older age groups. The main results are shown in Table 1.

Table 1. Potential years of life lost from hip fracture in Ecuador, 2019

Age group	Number of Deaths	Mean Age at Death	Remaining life expectancy	PYLL
60-64	0	62.5	22.5	0
65-69	4	67.5	17.5	70
70-74	7	72.5	12.5	88
75-79	12	77.5	7.5	90.0
80-84	23	82.5	2.5	58
Total PYLL				305

PYLL, *Potential years of life lost*

Conclusion: The number of deaths due to hip fracture increases with increasing age. If the number of hip fractures continues to increase, the total number of potential years of life lost due to hip fractures will increase. Effective prevention measures must be implemented to manage the risk of these fractures.

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COMPARATIVE ANALYSIS OF THE FREQUENCY OF EXACERBATIONS IN PATIENTS WITH JUVENILE IDIOPATHIC ARTHRITIS DURING METHOTREXATE DISCONNECTION

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Objective: Currently, there are a limited number of publications on methotrexate (MTX) discontinuation in patients with various forms of juvenile idiopathic arthritis (JIA), which makes this problem relevant. In this regard, the aim of this study is to compare the frequency of exacerbations after methotrexate discontinuation in patients with articular forms of JIA receiving MTX monotherapy and MTX in combination with genetically engineered biological drugs (GEBD), who are in remission.
Methods: The study included 117 patients aged 0 to 18 years with articular forms of JIA (diagnosed based on ILAR criteria) in remission according to C.Wallace criteria for more than 2 years. The main group included 81 (69.3%) patients with JIA receiving MTX therapy. The comparison group included 36 (30.7%) children receiving MTX and GIBP therapy. The number of girls was 52 (64.2%) and 20 (55.6%) in the main and comparison groups, respectively. The average duration of the disease was 5.8±1.6 years in the main group, 6.1±2.1 years in the comparison group. The average duration of methotrexate therapy was 3.5±1.2 years in the main group, 4.1±1.5 years in the comparison group. MTX therapy was discontinued in 32 (39.5%) patients and 23 (63.9%) in the main and comparison groups, respectively. The reasons for MTX discontinuation were: adverse events in the form of severe dyspepsia, hematological disorders in the form of persistent neutropenia, alopecia, and categorical refusal of patients to continue MTX therapy. In the main group, MTX was discontinued in 2 (6.2%) patients due to alopecia, 14 (43.8%) – dyspepsia, 16 (50%) patients categorically refused to continue MTX therapy. In the comparison group, MTX was discontinued in 2 (8.7%) patients due to persistent neutropenia, 8 (34.8%) – dyspepsia, 13 (56.5%) patients categorically refused to continue MTX therapy. Results: 12 weeks after MTX discontinuation, 3 (9.4%) patients in the main group had an exacerbation of the disease. By 24 weeks of observation after MTX discontinuation, 2 (6.3%) patients in the main group had an exacerbation. In the comparison group, 12 weeks after MTX discontinuation, an exacerbation was registered in 4 (17.4%) children, by 24 weeks - in 5 (21.7%).
Results: The frequency of exacerbations after MTX discontinuation in patients with articular forms of JIA was lower in the group of patients receiving MTX monotherapy compared to the group of patients receiving MTX and GIBP.

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DYNAMICS OF CLINICAL AND IMMUNOLOGICAL PARAMETERS OF EARLY RHEUMATOID ARTHRITIS ACTIVITY DURING SUBCUTANEOUS METHOTREXATE ADMINISTRATION

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Objective: to analyze and evaluate the nature of changes in clinical and immunological parameters of early rheumatoid arthritis (RRA) activity following subcutaneous methotrexate (MTX) administration.
Methods: 26 patients (19 women and 7 men) with confirmed early (according to ACR/EULAR criteria, 2010) RA aged 18 to 66 years (mean age 44.5±3.8 years) were examined. Most patients with RRA (80.6%) were seropositive for IgM (rheumatoid factor) and had grade III activity (57.8%) according to the DAS28 index. All patients with RRA were prescribed methotrexate in subcutaneous form as the first basic drug at an initial dose of 7.5 mg/week with rapid escalation of the drug dose to 20-25 mg/week in order to achieve the maximum possible therapeutic effect. As a result, 2, 6, 12 and 6 patients received 10, 15, 20 and 25 mg/week of MTX subcutaneously for at least 12 months. In parallel with the introduction of MTX, all patients took NSAIDs in standard doses.
Results: After 3 months, against the background of the therapy, the majority of patients (69.1%) showed positive dynamics in relation to the reduction of clinical and laboratory parameters of disease activity (duration of morning stiffness, intensity of pain syndrome, ESR, CRP) ($p<0.05$-0.001). The significance of differences was maintained for all studied parameters of RRA activity by 12 months of observation. Additionally, the effect of monotherapy with the subcutaneous form of MTX on the level of proinflammatory cytokines (TNF-α, IL-6) and a number of indicators of humoral and cellular immunity (IgA, IgM, IgG, CD4+, CD8+) was studied. Initially, the levels of both TNF-α and IL-6 and all studied parameters in the examined patients statistically significantly ($p<0.05$-0.001) differed from the data in the control group. At the end of the study (after 12 months), against the background of MTX monotherapy, a statistically significant ($p<0.05$-0.001) decrease in the level of almost all studied immunological parameters was established in patients with RRA.
Conclusion: The obtained results and literature data show that the subcutaneous form of MTX, along with its own anti-inflammatory activity, as evidenced by a reliable decrease in clinical and laboratory parameters reflecting the activity of PPA in the first 3 months of therapy, demonstrates a pronounced immunosuppressive efficacy.

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MAXIMAL STRENGTH IS A STRONG DETERMINANT OF HIP GEOMETRY INDICES IN A GROUP OF OLDER SARCOPENIC MEN

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Introduction: The aim of the current study was to explore the relationships between maximal strength parameters and hip geometry parameters in a group of older sarcopenic men.
Summary of facts and results: In all, 22 older sarcopenic men whose ages range from 60 to 86 (68 ± 6 years) participated in our study. Body composition and hip geometry indices (cross-sectional area (CSA) and cross-sectional moment of inertia (CSMI)) were evaluated by DXA. One-repetition maximum (1-RM) squat, 1-RM deadlift, 1-RM bench press, 1-RM military press and 1-RM seated cable row were directly measured on two non-consecutive days. All maximal strength parameters were positively correlated to CSA and CSMI. These positive correlations remained significant after controlling for age.
Conclusion: The current study shows that maximal strength is a positive determinant of CSA and CSMI in older sarcopenic men.

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TOE GRIP STRENGTH AND BONE MASS IN OLDER MEN

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Objective: The aim of the current study was to investigate the relationship between toe grip strength and bone mass in a group of older men.
Methods: 60 Lebanese men whose ages range between 60 and 75 participated in our study. The study was granted ethical approval by the Institutional Review Board (IRB) of the University of Balamand, Lebanon. Weight and height were measured, and body mass index was calculated. Body composition and bone mass were evaluated by bioelectrical impedance analysis (BIA), and skeletal muscle mass index (SMI) was calculated. Toe grip strength was measured using a T.K.K.3365b toegrip dynamometer (Takei Scientific Instruments, Japan). Maximal strength measurements (direct one-repetition maximum (1-RM) measurements) were also assessed using valid protocols.
Results: Toe grip strength was positively correlated to lean mass ($r = 0.81$; $p < 0.001$), SMI ($r = 0.87$; $p < 0.001$), 1-RM bench press ($r = 0.68$; $p < 0.001$), 1-RM biceps curl ($r = 0.66$; $p < 0.001$), 1-RM leg extension ($r = 0.72$; $p < 0.001$), 1-RM leg curl ($r = 0.74$; $p < 0.001$) and bone mass ($r = 0.62$; $p < 0.001$). All these positive correlations remained significant after controlling for age.
Conclusion: The current study suggests that toe grip strength is a positive determinant of lean mass, muscular strength and bone mass in older adults. These results are clinically important as they suggest that toe grip measurement might predict sarcopenia and osteoporosis in the elderly.

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PREVALENCE OF PATIENT SELF-REPORTED FRACTURE RISK FACTORS – PRELIMINARY ANALYSIS OF A DIGITAL STUDY IN THE PRIMARY CARE SETTING (SELF-FRAX)

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Fractures, particularly amongst older adults, pose a significant public health burden and place substantial pressures on NHS resources.
The SELF-FRAX study explores enhancing fracture risk assessments in primary care to ultimately improve treatment access. The aims of this observational cohort study are to investigate the prevalence of fracture risk factors in the primary care population (age ≥ 50 years) and measure the concordance between patient self-reported risk factors and those captured within their primary care electronic health record (EHR). This preliminary analysis focuses on patient self-reported risk factors.
GP practices using SystmOne EHR software from across England were approached (n=258) and recruited (n=182) through the NIHR Research Delivery Network. Men and women from consenting GP practices were screened by their surgery and eligible patients (n=500) were randomised into four equal sex/age strata (men: 50-65 and >65 years, and women: 50-65 and >65 years). Patients were invited to participate via a GP practice-generated SMS message containing a URL directing them to study information and an e-consent form. Consenting patients were invited to complete a SELF-FRAX questionnaire. Paper forms were available to patients without an active mobile phone number or by request.
Approximately 91,000 patients were approached and n=5208 questionnaire responses (99% digital) have been received to date (provisional response rate 6%). Participation is greater in women than in men, and the latter were older compared to women (see table)). Fracture risk factor prevalence was highest for previous fracture and lowest for current smoking. Some risk factors prevalences differed between the sexes (secondary osteoporosis, falls, parental hip fracture – women>men; alcohol intake, self-reported rheumatoid arthritis – men>women).
SELF-FRAX demonstrates that risk factor data collection using a digital approach is possible in the primary care setting. Further analysis will determine if a combination of patient self-reported and EHR data may permit targeted screening and intervention to

mitigate future fracture risk in primary care.

Table. Prevalence of fracture risk factors within men and women

	Male	Female	P-value
N (% of total recruited)	1876 (36.4)	3332 (64.6)	
Age, years (mean(SD), range)	67.4(9.1), 50-98	64.4(9.1), 50-98	<0.001
Previous fracture (n (%))	752 (40.2)	1292 (38.8)	ns
Secondary osteoporosis (n (%))†	130 (7.0)	674 (20.3)	<0.001
Parental hip fracture (n (%))	241 (12.8)	552 (16.6)	<0.001
Alcohol ≥3 units/day (n (%))	304 (16.3)	219 (6.6)	<0.001
Glucocorticoid use (n (%))	155 (8.3)	273 (8.2)	ns
Rheumatoid arthritis (n (%))	165 (8.8)	237 (7.2)	0.03
Current smoking (n (%))	86 (5.4)	181 (3.5)	ns
≥1 fall in the last 12 months (n (%))	235 (12.6)	593 (18.0)	<0.001
Longstanding poor mobility (n (%))	129 (6.9)	211 (6.4)	ns

† ≥1 risk factors for secondary osteoporosis including chronic kidney disease, malabsorption, premature menopause, hypogonadism, osteogenesis imperfect, type I diabetes, untreated chronic hyperthyroidism.

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GENOME-WIDE METHYLATION SIGNATURE OF RELATIVE TELOMERE LENGTH IN A COHORT OF SARCOPENIA AND FRAILTY PATIENTS OF LITHUANIAN ANCESTRY

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Objective. To identify and describe genome-wide methylation signature significantly associated with the relative telomere length in a cohort of Lithuanian elderly with sarcopenia and frailty.
Material and Methods. Methylation of a total of 62 subjects (43 females aged 85.5 ± 6.1 and 19 males aged 82.9 ± 8.8) diagnosed by both: sarcopenia (defined by the criteria set by EWGSOP2) and frailty (determined by Fried's criteria [weakness, low walking speed (WS), low physical activity, weight loss, exhaustion]) were profiled by Illumina Infinium EPICv2 arrays. Leucocyte relative telomere length (TL) was determined by real-time qPCR on DNA extracted from blood samples and quantified as the telomere/single-copy gene (T/S) ratio. Phenotypic data were collected via the questionnaires, scales, geriatric assessment tools (PACE, GDS and Katz ADS) and testing of anthropometric and physiological characteristics. Quality control and filtering of the raw methylation data was performed in R (4.4.2) by a package 'sesame' (v1.24.0) followed by a differential methylation analysis performed with R package 'DMRcate' (v3.2.1). Genomic locations of the differentially methylated regions (DMRs) significantly associated with the TL were analyzed in UCSC Genome browser. Trait associations with the genes, harboring identified DMRs were taken from NHGRI-EBI GWAS registry.
Results. The results showed that DNA methylation levels are not related to age or gender. The TL was associated with 49 differentially methylated CpG probes at 95% confidence level of false discovery rate (fdr <0.05). The CpG sites covered 7 genetic loci overlapping *FPGT, LRRIQ3, TNFSF9, ZDHHC14, LINC00240, MPL* and *SH3RF3* genes and regulatory ENCODE regions and *H3K27Ac* mark elements in them. These genes conjointly associated with phenotype of patients: smoking, alcohol consumption, educational attainment, mentality, depressive symptoms, body mass index (BMI), body fat mass, bone mineral density. LINC00240 associated with leucocyte TL.
Conclusions. We found significant association between the TL and methylation levels in genes associated with lifestyle traits potentially linked to the risk of developing sarcopenia and frailty in Lithuanian elderly.
This project has received funding from the Research Council of Lithuania (LMTLT), agreement No S-MIP-22-36.

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ANALYSIS OF PATHOLOGICAL CHANGES IN THE MAXILLARY SYSTEM IN PATIENTS WITH OSTEOPOROSIS AND RHEUMATOID ARTHRITIS

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Objective: Studying the relationship of pathological changes in the dental system with damage to organs and body systems in various systemic diseases such as rheumatoid arthritis (RA) and osteoporosis (OP) is an important task of modern medicine. To date, the manifestation of RA and OP in the maxillofacial region is considered as part of a general pathological process with a peculiar clinical picture peculiar to this area and with symptoms of important diagnostic importance. However, the features of the development of diseases of the hard tissues of the teeth, parotid tissues and oral mucosa remain not fully understood.
Materials and methods. 63 patients were examined and divided into groups. Group 1 included patients with osteoporosis on the background of rheumatoid arthritis with glucocorticoid therapy and receiving antiresorptive drugs, group 2 included patients with osteoporosis on the background of rheumatoid arthritis without glucocorticoid therapy and receiving antiresorptive drugs, and group 3 included patients with primary osteoporosis receiving antiresorptive therapy.
Results. During the comparative analysis, it was revealed that in group 1, the caries index was 5.58, fillings - 6.82, extracted teeth — 8.29; in group 2, the caries index was 6.12, fillings — 5.64, extracted teeth - 7.78; in group 3, the caries index was 2.52, fillings

– 8.02, teeth removed – 2.35. The average values of caries, fillings, and extracted teeth in the groups were 6.96, 6.54, and 4.29, respectively. When assessing the hygienic condition of the mouth in patients with osteoporosis on the background of rheumatoid arthritis, an increase in the indicator was noted compared with the control group. The deterioration of oral hygiene increased as the inflammatory activity of rheumatoid arthritis increased, which indicates that as destructive changes in the joints of the hands with impaired function progress, the oral hygiene process becomes more difficult.

Conclusion. Thus, patients with RA have a high level of dental caries intensity (≈20.26) with a predominance of extracted teeth and its complications in the CPI structure; chronic generalized periodontitis is noted, the severity of which increases with increasing inflammatory activity of the underlying disease. An unsatisfactory level of oral hygiene has been established, which progresses with increasing degree of inflammatory activity of RA, functional limitations of joints and a low level of hygienic knowledge comes more difficult.

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LUNG LESIONS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Objective. Damage to the respiratory system is one of the most common manifestations of rheumatoid arthritis (RA). According to available data, interstitial lung disease (ILD) occurs in 28.4-29.2% of patients with RA. Respiratory complications in RA account for 20% of deaths, being the second cause of death in patients with RA.

Materials and methods. The results of CT scans and medical histories of 43 patients with RA and lung damage aged 20 to 70 years, including 31 men and 12 women, were analyzed.

Results. During the study, it was found that the greatest number of lung lesions in patients with RA is observed between the ages of 60 and 70 years, both in men and women with the same occurrence, which may be due to age-related changes in the respiratory and immune systems as a whole. In turn, among lung diseases, common interstitial pneumonia (IPR) occurred in 31 (72.0%), while the remaining 12 patients accounted for 16.2% with nonspecific interstitial pneumonia (IPR), 4.6% of patients with bronchiolitis obliterans, 2.3% of patients with thickening areas, 2.3% with lymphocytic IP and with ISL, complicated by a fungal infection, respectively. According to the outcome of the disease, 31 people (72.0%) recovered with various residual changes in the lungs, 10 (23.2%) patients were among the unfavorable cases - fatal, and only 2 patients (4.6%) had a complete recovery, without changes in the lungs. Among the characteristic symptoms of ISL on CT, the following were most common: frosted glass - 22 (51.1%), cellular lung – 29 (67.4%), consolidation – 7 (16.2%), bronchiectasis – 23 (53.4%), emphysema – 7 (16.2%), atelectasis – 2 (4.6%) focal formations – 6 (13.9%), pleural effusion – 5 (11.6%).

Conclusion: Thus, the results of the study showed that in patients with RA, AML is often found at the age of 60-70 years in men and women with the same frequency of occurrence, which may be related to functional and age-related changes in the respiratory system. Among lung pathologies, OIP and NIP were noted in 39 patients, which amounted to 90.6%. According to the study data, in patients with a history of RA and lung damage, the outcome of the disease was, as a rule, an unfavorable outcome of 23.2% or a relatively favorable 72.0%, and therefore timely diagnosis by CT scan is an integral part of modern radiology and rheumatology.

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CORRELATION BETWEEN SARCOPENIA AND OSTEOPOROSIS IN GERIATRIC AGES

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Sarcopenia is the progressive age-related loss of muscle mass and strength. Sarcopenia is a type of muscle atrophy caused mainly by the natural aging process. In the geriatric age, the risk for osteoporosis increases. Osteoporosis is a major clinical problem in the geriatric age. The more the age after menopause increases, the more the risk of osteoporosis increases.

Purpose: Evaluation of the correlation between sarcopenia and osteoporosis in the geriatric age.

Material and methods: 72 patients with an average age of 67±2.3 years were taken into the study, and muscle mass was evaluated through: anthropometric measurement techniques, muscle strength and assessment of physical performance, bone density through lumbar and coxofemoral DXA scan.

Result: Bone density in the study group was -2.4±1.7 (advanced osteopoenia and osteoporosis values). The assessment of sarcopenia in the study group based on the criteria that were evaluated: muscle strength, muscle quantity or quality and physical performance resulted in moderate to severe sarcopenia for all 3 of these criteria. Statistical analysis showed that sarcopenia was significantly associated with the risk of osteoporosis (OR, 3.1; 94% CI,) and each standard deviation decrease in the relative mass of skeletal muscle was significantly associated with an increase in the risk of osteoporosis (OR, 0.72). ; 97% CI).

Conclusion: This study showed that sarcopenia and osteoporosis are highly correlated. Osteoporosis is closely related to the risk of sarcopenia.

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BONE MINERAL DENSITY IN HIV PATIENTS UNDER ANTIRETROVIRAL TREATMENT

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Introduction: Osteoporosis is a bone metabolic disease that affects postmenopausal women, but is also found in many other pathologies. Patients infected with HIV present problems with bone metabolism caused by the HIV virus itself but also by antiretroviral therapy.
Aim: Evaluation of the impact of antiretroviral therapy on bone density in HIV-infected patients
Material and methods: 150 patients aged 25-40 years (male 85 patients 56.6% female 65 patients 43.3%) infected with the HIV virus, not at the AIDS stage, were taken into the study. We measure the bone density in all the patients through DXA (dual x-ray absorptiometry) in spine and hip before starting antiretroviral therapy after 12 months and 24 months. The patients were evaluated with the serum level of vitamin D, calcium, phosphorus, osteocalcin (0.7-6.5ng/mL) and CD4 level (500-1500 cells/mm^3) after 12 and 24 months.
Results: The level of DXA spine resulted: before the start of antiretroviral therapy T-score -0.5 ±0.5, after 12 months of therapy -1.1±0.65 and 24 months after therapy -1.7±0.95; the level of DXA of hip resulted: before the start of therapy -0.3±0.7, after 12 months -1.3±0.91 and after 24 months -2.1±0.97. All patients present altered values of the serum level of vitamins D, osteocalcin, phosphorus and calcium. What was seen in the study was a decrease in the level of osteocalcin in these patients in all three measurements (4.5±2.1ng/mL; 3.1±0.7ng/mL; 1.1±0.9ng/mL). The of CD4 level showed different alterations in different patients during antiretroviral treatment.
Conclusion: Antiretroviral therapy presents its impact on bone mineralization by presenting a decrease in T-score values at the spine and hip, but more at the hip with an increased risk of fractures. A direct correlation was found between the serum level of osteocalcin, T-score measured in DXA in these patients where the decrease in the serum level of osteocalcin during therapy was accompanied by a decrease in Tscore values (p≤0.05). No correlation was found between the serum levels of CD4 and the T-score value measured in DXA.

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DIFFICULT TO TREAT RHEUMATOID ARTHRITIS: PREVALENCE AND RISK FACTORS

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Objectives:
Our study aimed to determine the frequency of D2T RA and to define the different risk factors leading to its occurrence.
Material and methods :
We conducted a cross-sectional study among patients diagnosed with RA at a tertiary care university hospital in Tunis. Sociodemographic, clinical, biological, and follow-up characteristics were collected.
Results :
We included 120 patients diagnosed with RA. The mean age was 57 years with 83.3% of women. The mean age at diagnosis was 45.5 years, and the mean diagnostic delay was 28 months. Comorbidities including diabetes, hypertension, and dyslipidemia were noted respectively in 14.7%, 15%, and 6.7% of patients. Sixteen percent were active smokers. Only 25% have reached the secondary education level, while 36.7% were illiterate. An average of 62.5% were unemployed. Polyarticular onset pattern was seen in 81% of patients, and oligoarticular in 7.5%. At diagnosis, 18% had extraarticular manifestations, 62.5% had joint deformities, and 94% had erosive RA. Rheumatoid factor and anticitrullinated peptide antibodies were positive respectively in 95% and 80%. Coxitis and antlanto-axial instability were noted in 11.7% and 17.5% respectively. The mean C-reactive protein (CRP) level was 16 mg/L, and the disease activity score 28 (CRP) was 4.5 indicating a moderate disease activity. Seventy percent of patients were on corticosteroids with an average dose of 10mg/l in 56.6%. Combination therapy (3 concomitant csDMARDs) was noted in 36.7% of patients. Seventy-eight percent adhered to their treatment. D2T RA was detected in only 12 patients (10%).
A significant correlation was noted between the occurrence of D2T RA and female gender (p=0.005), age (p<0.001), age at diagnosis (p<0.001), a significant diagnostic delay (p<0.001), diabetes (p=0.002), smoking (p=0.004), and history of combination therapy (p<0.001).
Conclusion :
D2T RA represents a significant challenge, with a multifactorial etiology. Female gender, advanced diagnostic age, diagnostic delay, diabetes, smoking and combination therapy seems to influence the evolution to a D2T RA.

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PREVALENCE AND IMPACT OF OSTEOPOROSIS IN EARLY PSORIATIC ARTHRITIS: INSIGHTS INTO BONE HEALTH AND INFLAMMATORY MECHANISMS

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Background:
Psoriatic arthritis (PsA) is a systemic inflammatory disease associated with psoriasis, characterized by joint damage and functional impairment. While joint inflammation is a major focus, osteoporosis remains an underexplored comorbidity in PsA, despite its significant impact on patient outcomes. Chronic inflammation

and dysregulated cytokine activity, including TNF-α and IL-17, contribute to bone resorption and impaired bone formation, increasing the risk of fractures.

Objectives:

This study aimed to assess the prevalence of osteoporosis in early PsA, its relationship with disease activity and inflammatory markers, and to compare bone health in PsA and rheumatoid arthritis (RA) patients.

Methods:

A total of 100 patients were evaluated, including 70 PsA patients (diagnosed by CASPAR criteria) and 30 RA patients. Bone mineral density (BMD) was measured using dual-energy X-ray absorptiometry (DXA) at the lumbar spine and femoral neck. Serum levels of calcium, vitamin D, and bone turnover markers were assessed. Ultrasound (USG) imaging with Power Doppler was performed to identify synovial proliferation and enthesopathies, and correlations between inflammatory activity and bone health were analyzed.

Results:

Osteoporosis was identified in 32.9% of PsA patients, with an additional 41.4% presenting osteopenia. RA patients showed a slightly higher osteoporosis prevalence (43.3%). In PsA, high disease activity (DAS28 > 5.1) was significantly associated with lower BMD at the femoral neck ($p < 0.05$). Vitamin D deficiency was prevalent in 64.3% of PsA patients. USG detected synovial vascularization and enthesopathies in 10% of PsA patients, correlating with elevated inflammatory markers (ESR, CRP) and reduced BMD ($r = -0.61$, $p < 0.01$). Enthesopathies were linked to localized bone erosion and peri-entheseal osteopenia.

Conclusions:

Osteoporosis is a significant comorbidity in early PsA, driven by chronic inflammation and high disease activity. Early BMD assessment and proactive management, including anti-inflammatory therapies and vitamin D supplementation, are essential. USG is a valuable tool for identifying inflammatory changes impacting bone health. Addressing osteoporosis in PsA is critical for improving patient outcomes and preventing long-term disability.

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INTERCONNECTION BETWEEN BONE LOSS AND EARLY PSORIATIC ARTHRITIS: EMPHASIZING OSTEOPOROSIS AS A COMORBIDITY

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Background:

Psoriatic arthritis (PsA) is a chronic inflammatory condition frequently associated with psoriasis, marked by joint inflammation and structural damage. The interplay between PsA and bone health, particularly osteoporosis, remains underexplored, despite osteoporosis being a significant comorbidity in inflammatory diseases. Identifying early PsA manifestations and osteoporosis prevalence can improve outcomes by enabling timely interventions.

Objective:

To evaluate the prevalence and clinical implications of osteoporosis in patients with early PsA, emphasizing the need for comprehensive bone health assessment as part of PsA management strategies.

Methods:

A retrospective observational study included 103 psoriasis patients hospitalized in the Rheumatology and Arthrology departments of the Republican Clinical Hospital "Timofei Moșneaga" between 2019 and 2024. Inclusion criteria encompassed adults aged 18-70 years diagnosed with PsA per CASPAR criteria. Data collection involved mPEST screening, laboratory tests, bone mineral density (BMD) assessment, musculoskeletal ultrasonography, and MRI. Statistical analysis was performed using Statistica 9.0.

Results:

Out of 103 psoriasis patients (47 men, 56 women; mean age 44 ± 13.69 years), 61 (59.2%) were diagnosed with PsA. Early PsA (≤2 years duration) was present in 52.5% of cases. Osteoporosis or reduced BMD was identified in 42.6% of PsA patients, correlating significantly with high disease activity, prolonged inflammation, and glucocorticoid use. Imaging techniques revealed synovitis in 83% and tenosynovitis in 89.3% of cases, with 40.4% showing bone erosions on MRI. Dactylitis (65.6%), enthesitis (41%), and nail psoriasis (63.7%) were common predictors of PsA. Comorbidities, including hypertension (33%) and type II diabetes (10.7%), were prevalent.

Conclusions:

This study highlights osteoporosis as a common and underdiagnosed complication in early PsA. Chronic inflammation, systemic treatments, and altered bone metabolism exacerbate bone loss. Early PsA diagnosis, facilitated by clinical signs, imaging modalities, and bone health assessments, is essential for preventing further structural damage. Integrating osteoporosis screening and management into PsA care can enhance overall outcomes, emphasizing the interdisciplinary collaboration between rheumatologists, dermatologists, and endocrinologists.

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COMORBIDITIES OF OSTEOARTHRITIS, OSTEOPOROSIS, AND SARCOPENIA IN PSORIATIC ARTHRITIS: CLINICAL AND THERAPEUTIC PERSPECTIVES

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Background

Osteoarthritis (OA), osteoporosis (OP), and sarcopenia are prevalent musculoskeletal disorders, often coexisting and exacerbating each other's clinical and functional impact. These

interrelated conditions increase the risk of falls, fractures, and disability, particularly in patients with systemic inflammatory diseases such as psoriatic arthritis (PsA). Despite advances in managing these conditions independently, their overlapping pathogenetic mechanisms and cumulative burden remain underexplored.

Objectives

This study aimed to assess the prevalence and interplay of OA, OP, and sarcopenia in PsA patients, focusing on disease activity, functional outcomes, and quality of life. The study also evaluated the clinical utility of integrated diagnostic and therapeutic strategies targeting these coexisting conditions.

Methods

A cohort of 46 PsA patients was analyzed using clinical, laboratory, and imaging assessments. Disease activity was measured using DAPSA, while OA severity was evaluated through radiographic Kellgren-Lawrence (KL) grading. Bone mineral density (BMD) was assessed using dual-energy X-ray absorptiometry (DXA) to diagnose OP. Sarcopenia was identified per EWGSOP2 criteria, combining muscle strength (handgrip), muscle mass (DXA), and physical performance (gait speed). Patient-reported outcomes included HAQ-DI, FACIT-F, and SF-36. Statistical analyses explored correlations between OA, OP, sarcopenia, and clinical indices.

Results

Among the cohort, 67.4% had OA, 43.5% were diagnosed with OP, and 47.8% met criteria for sarcopenia. Patients with sarcopenia had significantly lower BMD at the hip and lumbar spine (T-score: -2.6±0.4) and worse KL grades ($p<0.01$). Multimorbidity was strongly associated with higher DAPSA scores ($r=0.732$, $p<0.001$) and poorer functional outcomes (HAQ-DI: 2.4±0.8, $p<0.01$). Sarcopenia and OP were significant predictors of reduced gait speed and increased fall risk (OR=3.2, $p=0.02$). Quality of life, assessed via SF-36, was markedly impaired in patients with combined OA, OP, and sarcopenia.

Conclusions

The coexistence of OA, OP, and sarcopenia in PsA patients represents a significant clinical challenge, contributing to disability, reduced quality of life, and increased healthcare needs. These findings highlight the importance of early detection, comprehensive assessment, and multidisciplinary management strategies targeting these interrelated conditions. Interventions that address inflammation, bone health, and muscle function concurrently can improve outcomes and reduce the cumulative burden in this high-risk population.

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OSTEOPOROSIS AND OCULAR INVOLVEMENT IN RHEUMATOID ARTHRITIS

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Background Rheumatoid arthritis (RA) is a systemic autoimmune disorder associated with chronic inflammation, leading to joint damage, extra-articular complications, and osteoporosis. Among these manifestations, dry eye syndrome (DES) is prevalent and correlates with systemic inflammation. This study focuses on the relationship between RA, osteoporosis, and ocular inflammation, highlighting the effects of disease-modifying antirheumatic drugs (DMARDs) on both conditions.

Objectives To assess the prevalence of osteoporosis in RA patients with DES, evaluate the impact of DMARDs on bone mineral density (BMD) and DES severity, and explore correlations between systemic inflammation, ocular health, and bone loss.

Methods Seventy-five RA patients with DES (150 eyes), aged 40–75 years, were included in this study. Participants were divided into csDMARD (40 patients) and bDMARD (35 patients) groups. Disease activity was measured using DAS28-CRP, while DES severity was evaluated with Schirmer's test, Ocular Surface Disease Index (OSDI), and tear osmolarity. BMD was assessed via dual-energy X-ray absorptiometry (DEXA) at the lumbar spine and femoral neck. Serum inflammatory markers and bone turnover markers were also analyzed pre- and post-treatment.

Results Osteoporosis was identified in 52% of patients, with higher prevalence among those on csDMARDs. After six months, bDMARD therapy significantly improved BMD (mean T-score increase of 0.3 ± 0.1, $p<0.05$), compared to 0.1 ± 0.05 in the csDMARD group. OSDI scores improved by 46.2% in the bDMARD group versus 38.2% in the csDMARD group, with better tear osmolarity and Schirmer's test results in bDMARD-treated patients. Systemic inflammation markers, including CRP and ESR, decreased significantly in both groups, correlating with improvements in BMD and DES severity.

Conclusions This study highlights the interconnected impact of systemic inflammation on osteoporosis and DES in RA patients. The superior efficacy of bDMARDs in controlling inflammation contributes to improved BMD and milder ocular symptoms, underscoring the importance of aggressive treatment strategies. Early intervention targeting both bone and ocular health is essential to optimize outcomes and enhance the quality of life in RA patients.

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RHEUMATOID ARTHRITIS IN CORRELATION WITH KERATOCONJUNCTIVITIS, UVEITIS AND OSTEOPOROSIS

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Background Rheumatoid arthritis (RA) is a systemic autoimmune disorder characterized by chronic inflammation, leading to joint destruction and extra-articular complications, including ocular conditions such as keratoconjunctivitis and uveitis, as well as os-

teoporosis. The interplay between systemic inflammation, ocular health, and bone metabolism is complex, impacting both diagnostic and therapeutic approaches.

Objectives To evaluate the prevalence and interconnection of keratoconjunctivitis, uveitis, and osteoporosis in RA patients and to analyze the effects of systemic inflammation and RA treatments on these conditions.

Methods A retrospective observational study was conducted on 124 RA patients aged 35–75 years, with disease durations ranging from 1 to 20 years. Ocular manifestations were assessed using slit-lamp examination, Schirmer's test, and fundoscopy. Bone mineral density (BMD) was measured using dual-energy X-ray absorptiometry (DEXA). RA activity was evaluated with DAS28-CRP scores. Patients were stratified based on their treatment regimens: conventional synthetic DMARDs (csDMARDs) or biological DMARDs (bDMARDs). Serum levels of inflammatory markers (CRP, ESR) and bone turnover markers (osteocalcin, CTX) were analyzed.

Results Ocular manifestations were observed in 62.9% of patients: keratoconjunctivitis (47.6%) and uveitis (15.3%). Osteoporosis was present in 58% of patients, with a higher prevalence among those with severe RA activity (DAS28-CRP >5.1). Patients on bDMARDs exhibited lower rates of severe ocular inflammation and better BMD outcomes compared to those on csDMARDs. Specifically, uveitis incidence was reduced by 33%, and BMD improved by 0.4 ± 0.2 T-score units ($p<0.05$) in the bDMARD group after 12 months. Significant correlations were found between systemic inflammation markers and both ocular and bone parameters (r=0.68 for CRP vs. ocular scores, r=0.72 for ESR vs. BMD loss).

Conclusions RA-associated keratoconjunctivitis, uveitis, and osteoporosis are closely linked to systemic inflammation. bDMARDs demonstrate superior efficacy in reducing inflammatory activity, mitigating ocular complications, and preserving bone health. Early and aggressive management addressing both joint and extra-articular manifestations is essential to improve patient outcomes and quality of life.

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MORPHOLOGICAL TRAITS ACCORDING TO BMI OF LRP5 RS121908669 GENOTYPE CARRIERS

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Objective: Descriptive diagnostics is a part of clinical diagnosis. It is not reliable, but it is prompt. Therefore, it is necessary to determine the phenotypes of the genotypes of carriers of LRP-5G171R. This study is the first of its kind worldwide.

Material and Methods: This cross-sectional study was performed on 150 premenopausal and postmenopausal women with a mean age of 40 years. Body mass index (BMI) was calculated. To determine the genotypes of LRP5 rs121908669, a PCR-RFLP assay was performed, and the results were confirmed by DNA sequencing. The likelihood test, chi-square test, binary logistic regression test, and odds ratio test were used to determine the associations between BMI and the genotype of LRP5G171R.

Results: The likelihood test confirmed the relationship between BMI and LRP5G171R ($\varkappa 2$ =15.658, p=0.048). The results indicate that there are positive correlations between obese BMI and extremely obese BMI and between obese BMI and GG ($\varkappa 2$ =23.707, 14.013 p=0.000, 0.00). There was a negative correlation between a normal BMI and GG ($\varkappa 2$ =19.675, p=0.000). There was a negative correlation between extremely obese BMI and CC ($\varkappa 2$=12.466, p= 0.000). There was a negative correlation between BMI and GC in obese individuals ($\varkappa 2$ =19.997, p=0.000).

Discussion: No previous studies have identified morphological traits in terms of BMI, but in general, studies confirm that the relationship between the LRP5 gene and metabolism and adipocyte biology is significant. This is consistent with the results of this study.

Conclusion: Finally, obesity and extreme obesity are positive factors. The carriers of the mutant LRP5G171R (GC, CC) will be protected from obesity, unlike carriers of the normal genotype (GG), which will suffer from obesity. This SNP can be added to NCBI as an SNP associated with obesity.

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HORMONE REPLACEMENT THERAPY AND THE RISK OF KNEE AND HIP REPLACEMENT: INSIGHTS FROM THE OSTEOLAUS COHORT STUDY

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Background: The potential benefit of hormone replacement therapy (HRT) on the risk of incident joint replacement, remains a debated topic due to mixed evidence from both interventional [1] and observational studies [2].

Objectives: In this study we assessed the association of HRT status and duration with the incidence of total knee (TKR) or hip replacement (THR) among post-menopausal women.

Methods: We conducted a population-based cohort study using data from the longitudinal OsteoLaus study [3], which included five consecutive visits conducted at regular intervals over a 10-year period between 2010 and 2022. We included participants who had a minimum follow-up duration of 7.5 years (n=1026). Incidence of TKR and THR was evaluated using DXA images obtained during each visit. Participants with joint replacement at baseline or following hip fracture were excluded (n=87). Cox proportional hazard models estimated the hazard ratio (HR) and 95% CIs of incident TKR or THR associated with the status (never, past, current) and duration of self-reported HRT use. Results were adjusted for age, BMI, femoral neck BMD, calcium use, osteoporotic drugs use, comorbidities, ΔBMI, ΔBMD as well as HRT start age and duration after baseline.

Results: Incidence rates of TKR and THR were 7.0 and 6.1 per

1000-person years, respectively. Mean follow-up durations were 5.6±2.7 years for TKR (n=63), 5.1±2.3 yrs for THR (n=55) and 9.3±1.5 yrs for controls (n=908). Participants with incident TKR were significantly older (66.4±6.2 vs. 63.1±7.2 yrs), had higher BMI (29.2±4.8 vs. 25.2±4.3 kg/m^2), and femoral neck BMD (0.76±0.10 vs. 0.73±0.11 g/cm^2) than controls at baseline. Participants with incident THR were older (66.6±5.7 yrs) and had higher femoral neck BMD (0.77±0.14g/cm^2) than controls. There were no significant differences in the proportion of past (29.1%/33.3%/29.1 %) and current (24.7%/31.7%/27.3 %) HRT users at baseline between controls, TKR and THR, respectively. Current HRT users did not significantly associate with increased risk of TKR (HR 1.46, 95%CI (0.92-2.31)) or THR (HR 1.34, 95%CI (0.67- 2.67)). HRT starting age was similar between TKR (49.6 ±4.8 yrs), THR (49.1 ±5.3 yrs) and controls (50.8 ±8.3 yrs). Duration of HRT use at baseline was significantly longer for TKR cases (13.2 ±9.0 yrs) compared with controls (9.2 ±7.8 yrs), but not THR cases (12.1 ±9.0 yrs). Longer HRT duration at baseline was associated with an increased risk of TKR (HR 1.06, 95%CI (1.01-1.11)) but not THR (HR 1.03, 95%CI (0.95-1.11)).

Conclusion: In conclusion, longer HRT duration may increase TKR risk, potentially through hormonal effects on body composition and bone remodeling. No association was found with THR, suggesting differing pathophysiological mechanisms.

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PERSONALIZED 3D MORPHOMETRIC ANALYSIS OF THE MENISCUS IN MEDIAL KNEE OSTEOARTHRITIS: IMPLICATIONS FOR DIAGNOSIS AND TREATMENT

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Objective: To perform a region-specific, 3D morphometric analysis of the medial meniscus in MRI-based osteoarthritic (OA) and healthy knee models, focusing on meniscal thickness, width, and tibial coverage. **Methods:** High-resolution MRI and CT datasets from a healthy and OA knee joint were used to reconstruct 3D geometric models of the medial meniscus and tibia. The meniscus was subdivided into anterior, middle (body), and posterior regions for region-specific analysis. The meniscus was subdivided into anterior, middle (body), and posterior regions for region-specific analysis. We applied 3D spline interpolation to generate equidistant control points along the meniscal surface, ensuring a smooth representation. These control points were utilized to measure meniscal thickness and width using 3D surface analysis and geometrical metrics. Tibial coverage was calculated as the ratio of meniscal surface area to tibial plateau area. For the OA knee, medial meniscus extrusion (MME) was assessed by measuring displacement from the tibial plateau, with a threshold of ≥3 mm. **Results:** In the healthy knee, posterior meniscal width (12.96 ± 2.78 mm) was significantly greater than the middle (8.33 ± 0.44 mm) and anterior (7.67 ± 0.69 mm) regions. Similarly, in the OA knee, posterior width (8.59 ± 2.34 mm) was larger than both the middle (7.84 ± 0.59 mm) and anterior (6.54 ± 1.28 mm) regions, though to a lesser extent than in the healthy knee. Meniscal thickness was greater in the healthy knee across all regions: anterior (3.55 ± 1.30 mm), middle (4.53 ± 0.71 mm), and posterior (4.12 ± 1.47 mm), compared to the OA knee, which exhibited reduced thickness:anterior (3.34 ± 1.55 mm), middle (3.77 ± 1.65 mm), and posterior (4.03 ± 1.35 mm), indicating regional thinning in OA tissue. Tibial coverage of the medial meniscus was significantly reduced in the OA knee, with the healthy knee covering 62.1% of the medial tibial plateau, compared to only 32.1% in the OA model. Additionally, the OA knee exhibited MME of ≥ 3 mm, indicating significant displacement compared to the healthy knee. **Conclusion:** These findings highlight progressive structural changes in the medial meniscus in OA, suggesting that 3D morphometric analysis could serve as a valuable tool for early detection and personalized treatment strategies in knee osteoarthritis.

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TAURINE EFFECTS ON THE EXPRESSION OF TYPE II COLLAGEN AND GENES ASSOCIATED WITH ENERGY METABOLISM AND INFLAMMATION IN THE ARTICULAR CARTILAGE EXPLANTS CULTURED WITH TAURINE FROM PATIENTS WITH END-STAGE OSTEOARTHRITIS

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Objectives: To examine metabolic changes in the expression of genes associated with energy metabolism in the articular cartilage explants obtained from patients with end-stage osteoarthritis (OA) prior to arthroplasty and cultured with taurine.

Methods: Fourteen patients with end-stage OA (median age 58 years) were examined. Full-depth explants of human OA knee articular cartilage from arthroplasty were cultured with 50 μM taurine during 24h. Total RNA isolated from these cells was used for gene expression studies performed with quantitative real-time RT-PCR.

Results: Taurine was capable of modifying gene expression in cultured articular cartilage explants from the examined patients with OA compared with untreated counterparts. Gene expression of glycolysis –related pyruvate kinase, the Krebs cycle component succinate dehydrogenase, and electron transport chain element, uncoupling protein 1 was significantly upregulated in concert with ATP-synthase gene and AMP-activated protein kinase. Simultaneous upregulation of the autophagy-related ULK1 was

observed along with downregulation of the inflammation-related tumour necrosis factor α gene expression. Type II collagen gene expression was also upregulated. No significant changes in the expression of mammalian target of rapamycin and IL-1β genes were noted in cartilage explants from the examined patients with OA cultured with taurine compared with untreated counterparts.
Conclusion: The upregulation of genes associated with energy metabolism and type II collagen accompanied by downregulation of inflammation-related TNFα in articular cartilage explants obtained from patients with end-stage osteoarthritis from arthroplasty, indicates the involvement of whole cell metabolism in the manifestations of OA disease.

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METABOLIC CHANGES IN ENERGY METABOLISM AND INFLAMMATION IN THE PERIPHERAL BLOOD MONONUCLEAR CELLS CULTURED WITH TAURINE FROM PATIENTS WITH END-STAGE OSTEOARTHRITIS

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Objectives: To examine metabolic changes in the expression of genes associated with energy metabolism in the **peripheral blood mononuclear cells** (PBMCs) obtained from patients with end-stage osteoarthritis (OA) prior to arthroplasty and cultured with taurine.
Methods: Twenty five patients with end-stage OA (median age 58 years) were examined. PBMCs were isolated prior to arthroplasty using Ficoll density gradient and cultured with 50 μM taurine during 24h. Cell viability was monitored with 0.2% Trypan blue staining. Total RNA isolated from these cells was used for gene expression studies performed with quantitative real-time RT-PCR.
Results: Taurine was capable of modifying gene expression in cultured PBMCs from the examined patients with OA compared with untreated cells. Expression of glycolysis –related pyruvate kinase, the Krebs cycle component succinate dehydrogenase, and electron transport chain element, uncoupling protein 1 was significantly upregulated in concert with ATP-synthase gene. Simultaneous upregulation of the autophagy-related ULK1 was observed along with downregulation of the inflammation-related tumour necrosis factor α gene expression. No significant changes in the expression of IL-1β gene were noted in PBMCs from the examined patients with OA cultured with taurine compared with untreated counterparts.
Conclusion: The upregulation of genes associated with energy metabolism accompanied by downregulation of inflammation-related TNFα in PBMCs obtained from patients with end-stage osteoarthritis prior to arthroplasty, indicates the involvement of whole cell metabolism in the manifestations of OA disease.

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TAURINE PRODUCES CHANGES IN THE EXPRESSION OF GENES ASSOCIATED WITH ENERGY METABOLISM AND INFLAMMATION IN CULTURED PERIPHERAL BLOOD MONONUCLEAR CELLS FROM PATIENTS WITH END-STAGE RHEUMATOID ARTHRITIS

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Objectives: To examine metabolic changes in the expression of genes associated with energy metabolism in the peripheral blood mononuclear cells (PBMCs) obtained from patients with end-stage rheumatoid arthritis (RA) prior to arthroplasty and cultured with taurine.
Methods: Eleven patients with end-stage RA (median age 52 years) were examined. PBMCs were isolated prior to arthroplasty using Ficoll density gradient and cultured with 50 μM taurine during 24h. Cell viability was monitored with 0.2% Trypan blue staining. Total RNA isolated from these cells was used for gene expression studies performed with quantitative real-time RT-PCR.
Results: Taurine was capable of modifying gene expression in cultured PBMCs from the examined patients with RA compared with untreated cells. Expression of glycolysis –related pyruvate kinase, the Krebs cycle component succinate dehydrogenase, and electron transport chain element, uncoupling protein 1 was significantly upregulated in concert with ATP-synthase gene and downregulation of AMP-activated protein kinase. Simultaneous upregulation of the autophagy-related ULK1 was observed along with downregulation of the inflammation-related tumour necrosis factor α gene expression. No significant changes in the expression of IL-1β gene were noted in PBMCs from the examined patients with RA cultured with taurine compared with untreated counterparts.
Conclusion: The upregulation of genes associated with energy metabolism accompanied by downregulation of inflammation-related TNFα in PBMCs obtained from patients with end-stage rheumatoid arthritis prior to arthroplasty, indicates the involvement of whole cell metabolism in the manifestations of RA disease.

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AUGMENTED REALITY (AR) EXERGAMES IMPROVE STRENGTH AND REDUCE PAIN IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS: RESULTS FROM A CLINICAL TRIAL

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Background: Osteoporosis falls often lead to fractures. While physical therapy can help reduce fall and fracture risk, patient adherence is challenging. The potential of Augmented Reality (AR) in osteoporosis remains unknown despite its use in other conditions.
Purpose: To evaluate the effectiveness of AR exergames on muscle function and pain in osteoporosis patients.
Methods: We developed 4-bespoke AR exergames using active-videogames, overlaying virtual objects on the real world to create interactive physical activity experiences. They aligned with an approved osteoporosis training programme and will be demonstrated in an oral presentation. The intervention group used an AR-headset and body-tracking camera, while the control group followed a traditional exercise programme with the same exercises. In our clinical trial, we compared flexibility, strength, and pain between groups at baseline and study-end. Pain was assessed with the Visual Analogue Scale, flexibility with the Chair-Reach test, and strength with a grip strength test. Participants completed 12 bi-weekly 20-minute sessions.
Results: Of 48 females enrolled, 41 (aged 60–86 years) completed the study. All participants improved in muscle strength, flexibility, whilst experiencing reduced pain (Table 1). The intervention group showed greater strength gains and pain relief. The control group improved more in flexibility, though the intervention group was more flexible at baseline. Composite outcomes showed a median improvement of −3.77(SD:46.84) in the intervention group versus −5.01(SD:25.61) in the control group.
Table 1. Results

Characteristic	Control(n=21)		Intervention(n=20)	
	Baseline	End	Baseline	End
Mean Age(years)	69.7y(SD=6.3)		69.8y(SD=5.3)	
Pain-score	2.33(SD=1.8)	2.19(SD=2.5)	2.47(SD=2.04)	2.05(SD=2.55)
Muscle strength	20.9(SD=6.14)	20.8(SD=5.94)	20.15(SD=5.69)	22.85(SD=5.01)
Flexibility	6(SD=8.02)	0(SD=5.78)	1(SD=4.90)	0 (SD=3.84)

Conclusions: Both groups improved in muscle strength, flexibility, and pain; the intervention group showed greater strength gains and pain relief. This suggests AR exergames are as effective as/superior to, conventional rehabilitation, providing engaging experiences that enhance outcomes and adherence for older women with osteoporosis.

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EFFICACY OF BUROSUMAB IN MANAGING FGF23-RELATED HYPOPHOSPHATEMIC OSTEOMALACIA: FOCUS ON TRANSITION FROM PEDIATRIC TO ADULT CARE IN 15 CASES IN JAPAN

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Objectives: FGF23-related hypophosphatemic osteomalacia has been conventionally treated with neutral phosphate supplements and active vitamin D analogs. The anti-FGF23 antibody, burosumab, has become an additional therapeutic option for treating both congenital and acquired FGF23-related hypophosphatemic ricket and osteomalacia. However, data on the long-term outcomes of such treatments are limited. We here report the clinical features of 15 cases treated at our institution and also focus on the transition from pediatric to adult care.
Subjects: The study included 15 cases (6 males and 9 females). The median age at diagnosis was 5 years (range: 1–30 years), with all but one case being childhood–onset. The median age on their first visit to our hospital was 30 years (range: 15–59 years).
Results: At the time of initial medical examination, 5 patients were asymptomatic, while 9 reported pain, 3 experienced gait disturbances, 2 had muscle weakness, and 2 showed general fatigue. The mean serum P level in the conventional therapy group was 2.1 mg/dL and the mean TmP/GFR was 1.6 mg/dL. We treated 4 cases with conventional therapy and burosumab was administered in 11 cases including 7 newly administered cases. Clinical symptoms improved in all newly burosumab administration group. There is a discrepancy between TmP/GFR levels at 2 weeks (2.5 mg/dL) and 4 weeks (2.0 mg/dL) after burosumab administration in newly administered group.
Conclusion: The maximum dose of burosumab is currently 1 mg/kg (not exceeding 90 mg per dose) every 4 weeks, but according to a report by Karl et al., even at the maximum dose, 6% of patients did not have normalised serum P levels. The administration of burosumab to adult patients with FGF23-related hypophosphatemic osteomalacia improved phosphate metabolism and clinical symptoms, but the regimen of administration still needs to be improved.
Disclosure: Suzuki A has received honoraria from Kyowa-Kirin Co. for delivering lectures.

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WHAT DO WE KNOW ABOUT OSTEOARTHRITIS: DOES-IT TRANSLATE BETWEEN AFFECTED SPECIES?

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Objective: To edit a narrative review comparing the osteoarthritis (OA) phenotype observed in natural models of OA in cat and dog, as well as in experimental models in rat (when justified).
Material and Methods: Data extraction in the literature and the 30y experience in studying OA in pets focused on a comparison of different aspects of OA phenotype: 1) prevalence; 2) localisation; 3) risk factors; 3) detection and diagnosis; 4) OA mechanisms from the joint to the nervous alterations. Concurrent validation of experimental OA models was conducted, when justified.
Results: Osteoarthritis is a degenerative joint disease that has been established for a certain time to be the main source of chronic pain in cats and dogs, its prevalence in Western countries being around 25% for the adult population and reaching up to 65-85% in geriatrics. It could be of primary (mostly in cats) or secondary (in dogs) origin, and risk factors include congenital articular malformations (dysplasia, *etc*.), post-trauma, sterilisation, size and weight, as well as environment (obesity, excessive activity). It affects all appendicular joints (hip, stifle, hock and elbow) as well as (lumbar) vertebral axis (cats). A trilogy of OA-associated pain is expressed in pets, including biological (functional dysfunctions), psychological (behavioural changes, cognitive dysfunction) and social (changes in human-animal and animal-animal interactions) dimensions. Originally, the focus was on the biomechanical pain associated with cartilage degeneration and articular sclerosis, which was updated with structural remodelling including neuroplasticity and particularly peripheral and central sensitisation. Chemical OA models in rat are lacking face validity whereas the MI-RAT© model associating a surgically-induced stifle instability and calibrated exercise on treadmill was validated for spinal neuropeptidomics, neuroepigenetics, structural changes and pain phenotype.
Conclusion: The translation from experimental animal pain model to natural OA models appears increasingly appropriate to better characterise and propose effective clinical treatment of chronic pain.

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EVIDENCE-BASED EFFICACY IN OSTEOARTHRITIS MANAGEMENT FOR COMPANION ANIMALS

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Objective: To complete a scoping review of osteoarthritis (OA) pharmaceutical and non-pharmacological management in dog and cat.
Material and Methods: Data were extracted in the literature and a classification of therapeutic approaches was proposed, based on their efficacy and the quality of referenced studies. The quality of each study was evaluated through its experimental design, such as randomised, blinded, prospective, placebo-controlled, and the use of objective, validated pain assessments (favoured over subjective non-validated scales), and their statistical analysis.
Results: For the past 30 years, non-steroidal anti-inflammatory drugs (NSAID) efficacy in canine, and feline, OA has been reported in 40, and 15, publications, respectively. However, several of these studies contained significant shortcomings that call into question the reliability of the results obtained. For instance, only 13, and 8, studies used objective assessment measures such as podobarometric gait analysis or actimetry, while the others relied on subjective (partially validated, if any) scales to evaluate the treatment efficacy. Side effects were well listed and remain a major constraint in NSAID use, particularly for cats. Other analgesic treatments included anti-NGF monoclonal antibody (mAb), tramadol, gabapentin, and anti-viral drug amantadine. The two latter presented poor evidence of efficacy in very few studies. Although mAb got instantaneous popularity their indications of use remain to be precise and guidelines for potential safe and efficient use (safety of drugs combination, emergence of subpopulations more sensitive to side effects) are missing. Despite 25 articles on disease-modifying OA drugs (DMOAD) in dogs, no DMOAD was attractive in terms of structural and analgesic efficacy. At the head of the efficacy evidence pyramid for non-pharmacological therapies were placed caloric restriction and omega-3 polyunsaturated fatty acids (marine oil, or green-lipped mussels) with an excellent size effect d = 0.99. Joint injection of biologics as well as physiotherapeutic modalities presented limited evidence. No publication up to now considered specifically sensitisation to treat, other therapies presented anecdotal evidence, but sensorial enrichment looks promising.
Conclusion: Pets have a richer therapeutic arsenal than humans with OA disease, but it remains imperfect.

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VFX IN POSTMENOPAUSAL WOMEN WITH RHEUMATOID ARTHRITIS

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Background. Bone mineral density decreasing with the development of osteoporosis in rheumatoid arthritis is one of the significant complications of the disease. Osteoporotic vertebral fractures (VFx) are associated with chronic pain syndrome, decreased mobility and quality of life, and increased mortality.
Objective: to assess the impact of rheumatoid arthritis on the number of vertebral fractures in postmenopausal women.
Materials and methods. A cross-sectional controlled study was conducted. We studied 48 postmenopausal women with rheumatoid arthritis (main group), the control group - 25 postmenopausal women without rheumatoid arthritis. Exclusion criteria: age over 75 years, patients with a history of spinal injuries and musculoskeletal diseases of functional classes III - IV, a decrease in GFR less than 30 ml / min, with diseases and conditions associated with a decrease in BMD. We examined DXA, LVA, laboratory data.
Results. Patients of both groups were comparable in anthropometric and anamnestic data, did not differ in the content of total protein, cholesterol, triglycerides (p> 0.05). The average age of patients in the main group was 64.2 ± 9.77 years, the control group - 61.9 ± 5.23 years, U = 178.5, p = 0.165. When analyzing the LVA results, vertebral fractures were detected in 33.3% of patients in the main group, which is significantly higher than in the control group patients (16%, p = 0.02). The obtained data indicate a significantly increased incidence of VFx in postmenopausal women with rheumatoid arthritis compared to postmenopausal women without rheumatoid arthritis.
Conclusions. The results of the study indicate an increased incidence of vertebral fractures in postmenopausal women with rheumatoid arthritis compared to postmenopausal women without rheumatoid arthritis.

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AFABP IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Aim: to study the association of adipocyte fatty acid-binding protein (AFABP) with clinical and laboratory characteristics of RA
Materials and methods: 88 women with RA were enrolled in our study. All patients fulfilled the 2010 ACR/EULAR classification criteria for RA. AFABP serum levels were determined by enzyme-linked immunosorbent assay. 76 patients (86,4%) were taking glucocorticoids to control the activity of the disease. Homeostatic Model Assessment for insulin resistance (HOMA-IR) was calculated. Statistical analysis was performed using conventional methods with a software package "Statistica 10.0".
Results. Median serum level of AFABP was 60,8 (36,5-131,7) ng/ml, which is significantly higher than the normal values, suggested by the manufacturer (19,58±16,32 ng/ml). AFABP correlated positively with serum C-reactive protein (CRP) levels (ρ=0,39; p=0,018) and median accumulated dose of glucocorticoids taken for the last 12 months (ρ=0,25; p=0,033). However, there were no statistically significant correlations between AFABP with patients' weight (ρ=-0,03; p=0,776), BMI (ρ=-0,06; p=0,595) or RA disease activity by DAS28 (ρ=-0,03; p=0,748). More than that, HOMA-IR wasn't associated with serum levels of AFABP (ρ=-0,10; p=0,334).
Conclusions. AFABP is a cytosolic lipid chaperone, expressed by adipocytes and activated macrophages. Terra X. and co. demonstrated, that serum AFABP levels correlated positively with tumor necrosis factor receptors, CRP and interleukin-6 levels in patients with obesity (1). In our study, serum AFABP levels were higher in patients with RA, compared with suggested normal values. AFABP may be associated with systemic inflammation due to its correlation with serum CRP levels. Patients with higher accumulated dose of glucocorticoids taken for the last 12 months had higher serum AFABP levels. It is supposed, that glucocorticoids intake has such a profound effect on AFABP synthesis and secretion, that this protein loses the association with metabolic flux.
References.
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ASSOCIATION OF P1NP AND CTX-1 RATIO WITH BONE TURNOVER IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Aim: to determine the clinical relevance of serum levels of P1NP and CTX-1 ratio in patients with rheumatoid arthritis.
Methods: 88 women with RA were enrolled in our study. All patients fulfilled the 2010 ACR/EULAR classification criteria for RA. P1NP and CTX-1 serum levels were determined by enzyme-linked immunosorbent assay. 76 patients (86.4%) were taking glucocorticoids to control the activity of the disease. All patients underwent DEXA on GE Lunar DPX Pro scanner. Statistical analysis was performed using conventional methods with a software package "Statistica 10.0".
Results: Median values for serum CTX-1, P1NP and P1NP/CTX-1 ratio levels were 0.62 (0.42-0.81) µg/l, 48.8 (42.2-61.3) µg/l and 84.2 (59.6-114.6) (hereinafter Me (Q1-Q3)) respectively. Patients with osteoporosis had higher P1NP (53.0 (45.9-63.8) µg/l vs. 44.1 (36.1-59.4) µg/l; U=620.5; p=0.004) and P1NP/CTX-1 ration levels (103.5 (68.6-159.9) vs. 66.5 (49.2-94.3); U=594.0; p=0.002) levels. Moreover, only P1NP/CTX-1 ratio level was statistically significant associated with osteoporotic fractures (107.0 (68.6-167.5)

in patients with fractures vs. 80.7 (57.4-108.7) in patients without fractures; U=414.0; p=0.046). More than that, only CTX-1 serum levels correlated with the dose of glucocorticoids (GCs) taken at the time of study (Spearmen's ρ=0.31; p=0.015; calculated among 60 patients). However, despite the expectations we observed negative correlation between accumulated dose of GCs with CTX-1 serum levels (Spearmen's ρ=-0.38; p=0.001) and positive – with P1NP/CTX-1 ratio levels (Spearmen's ρ=0.36; p=0,002).
Conclusions: P1NP and P1NP/CTX-1 ratio levels are higher in patients with osteoporosis. P1NP/CTX-1 ratio levels are higher in patients with osteoporotic fractures. However, GCs intake can significantly affect the results of our study, due to its correlations with CTX-1 and P1NP/CTX-1 ratio levels, which should be taken in account when conducting further research.

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ERYTHROMELALGIA IN SYSTEMIC LUPUS ERYTHEMATOUS: A CASE REPORT

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Erythromelalgia (EM) is a rare vascular condition characterised by episodes of burning pain, redness, and warmth in the extremities. While commonly idiopathic, erythromelalgia (EM) can occur secondary to systemic conditions, including autoimmune diseases such as systemic lupus erythematous (SLE). Systemic lupus erythematous is a chronic multi system autoimmune disease that can lead to vasculitis, microvascular injury, and hyper coagulability, all of which may predispose to erythromelalgia.
Case presentation: This report describes the case of a 32-year-old female with a history of 2 months with burning sensation, warm and redness in feet, exacerbated by heat and relieved by cooling measures. Erythema gets better if legs were elevated. Laboratory tests were positive for antinuclear antibody (ANA) and anti-double stranded DNA, normal complement levels (C3, C4), negative for ENA profile and ANCA, d-dimer were high. Lab test for Brucellosis were negative. Inflammatory markers, including ESR and CRP were normal. A diagnosis of secondary erythromelalgia associated with systemic lupus erythematous was made. The patient was treated with edoxaban 60 mg, topical lidocaine for symptomatic relief, hydroxychloroquine and a short course of prednisone for disease control. Over three months, the patient reported significant improvement in erythromelalgia (EM) symptoms and overall quality of life.
Conclusion: This case underscores the rare but significant association between erythromelalgia and systemic lupus erythematous. Early recognition and tailored management can improve patient outcomes and prevent complications.

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LONG-TERM USE OF NIMESULIDE IN PATIENTS WITH OSTEOARTHRITIS AND COMORBIDITY

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Long-term therapy with non-steroidal anti-inflammatory drugs (NSAIDs) may be appropriate in patients with osteoarthritis (OA) suffering from chronic pain. However, the use of NSAIDs in patients with comorbidity in real-world clinical practice requires further study.
Aim: to evaluate the efficacy, safety and requirement for long-term administration of nimesulide in the 3-month treatment of OA.
Material and methods. The study group consisted of 282 patients, 79.4% women, age 54.5±8.9 years, with knee OA (50.0%), hip OA (12.4%) and multi-joint OA (37.6%). All patients had comorbidity, including 94.3% arterial hypertension (AH) and 22.7% type 2 diabetes mellitus. All patients had moderate to severe pain (≥4 on a numerical rating scale, NRS 0-10) for at least 3 months. All patients were prescribed nimesulide 100 mg twice daily. If pain decreased, a reduction in the dose of nimesulide to 100 mg daily or a switch to an on-demand regimen was suggested.
Results. After 1 and 3 months of therapy, 82.3% and 49.3% of patients continued to take nimesulide regularly, and 17.4% and 39.7% continued to take it 'on demand'. 11,0% of patients stopped taking the drug by 3 months, mainly because of pain control or significant pain reduction. In 1 and 3 months all patients showed significant improvement in the severity of the main symptoms of OA. Thus, pain on movement (NRS) decreased from 6.7 to 4.3 and 2.0; WOMAC pain from 11.3 to 7.3 and 3.9; impaired function (NRS) from 5.4 to 3.4 and 1.6; WOMAC function from 38.9 to 25.4 and 14.7 (for all parameters p<0.001). For all parameters, more than 75% of patients showed improvement ≥50% from baseline. 83% of patients reported an acceptable symptom state (PASS). After 3 months, no serious adverse events (AEs) were noted. Dyspepsia was noted in 3.9%, stool disturbance and gastroesophageal reflux disease in 3.2% each, hypertension in 4.6%, and hyperglycaemia in 1.1%. No withdrawal of nimesulide due to HP was noted.
Conclusion. Nimesulide is effective and relatively safe in the long-term treatment of patients with OA and chronic pain.
Keywords: Osteoarthritis, NSAIDs, nimesulide, Nise, long-term use, efficacy, safety

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PATIENT ACCEPTABLE SYMPTOM STATE IN RHEUMATOID ARTHRITIS ACCORDING TO SURVEY DATA

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Patient-reported outcomes (PRO) are important parameters for assessing the health status and therapy effectiveness in patients with rheumatoid arthritis (RA); however, the time-consuming nature of most methods for determining these indicators makes it difficult to use them in real clinical practice. A simple indicator to assess treatment outcomes from the patient's perspective is the Patient Acceptable Symptom State (PASS).

Aim. To identify the PASS in patients with RA and its association with the main PRO parameters using the survey data.

Material and methods. We collected data from an online survey of 2115 patients with RA, between January 2023 and November 2024. The survey assessed demographics, PASS and PRO (joint pain severity, fatigue, anxiety, depression, daily activity limitation, severity of joint pain, fatigue, anxiety, depression, daily activity, patient global assessment (PtGA) assessed using a numerical rating scale, NRS 0-10 points). 88.3% were women, mean age 46.4±13.9 years, mean disease duration 6 [3;13] years. 80% received conventional synthetic disease-modifying antirheumatic drugs (csDMARDs), 23.9% - biological DMARDs (bDMARD) and JAK inhibitors, 39.7% received glucocorticoids (GCs) and 67.9% received non-steroidal anti-inflammatory drugs (NSAIDs).

Результаты. According to the online survey, 45.8% of patients responded positively to PASS (PASS+). The mean PROs were: joint pain 5.6 ±2.7, fatigue 6.2±2.7, anxiety 5 [3;8], depression 5 [2;7], daily activity limitation 5 [3;7], PtGA 5.5±2.5. Negative response to PASS (PASS-), was associated with male gender, all PROs studied, and GC and NSAID intake. Therapy with bDMARD and JAK inhibitors, showed an inverse association with PASS-. Using binary logistic regression, a model was generated to predict PASS- in patients with RA. The following were included in the model: joint pain ≥4 NRS points, fatigue ≥7 points, anxiety ≥7 points, PtGA ≥4 points, treatment dissatisfaction (0 - no, 1-yes), GC and bDMARD and JAK inhibitors intake. In ROC curve analysis, the threshold value of the logistic function P was 49.7%, the area under the curve was 0.742 (95% CI: 0.721-0.764), the sensitivity of the model at the threshold value used reached 82%, and the specificity reached 60%.

Conclusion. Remote assessment has shown that in real clinical practice less than half of patients with RA are satisfied with their health status. PASS has a clear correlation with all investigated PROs (joint pain, fatigue, anxiety, depression, daily activity, PtGA) and can serve as an integral indicator of health status assessment and RA therapy effectiveness.

Keywords: rheumatoid arthritis; online survey; PASS; PRO; pain; fatigue; daily activity limitation; depression; anxiety.

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BONE MINERAL DENSITY AND BONE METABOLISM IN MEN WITH CHRONIC HEART FAILURE

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Objective: To evaluate BMD and indicators of bone metabolism in men with chronic heart failure (CHF).

Methods: The case-control study included 100 men aged 20-70 years (average age 54.34±11.16). The group of patients with CHF consists of 60 men with NYHA functional class (FC) I-III and left ventricular ejection fraction ≤50%. The control group was represented by 40 patients without CHF. BMD of the lumbar spine and the proximal femur was measured using DXA. Low bone mass was defined at the Z-score ≤-2 SD in men under 50 years and at the T-score ≤-2.5 SD in men over 50 years.

Results: The low BMD was registered in 74% in men with CHF. The analysis in the group with CHF showed the independent relationship of the BMD in all measured areas with FC CHF, adjusted for age and several covariates. The chance of detecting low bone mass in patients with functional class II and III is 1.9 times higher than with functional class I (OR=1.91; 95%CI [1.14-3.21], p=0.023). Vitamin D deficiency was detected in 62% of patients with CHF and 52% control group (p=0.36), insufficiency - in 23% and 35% (p=0.32) respectively. The concentration of the bone formation marker P1NP was significantly lower in the main group compared to the control group (37 [32;54] ng/ml vs 51 [38;66] ng/ml (p=0.007)). Among the bone metabolism markers, only CTx was independently associated with clinical and echocardiographic signs of CHF, in particular, with the stage of CHF (β=0.137, p=0.001), left ventricular ejection fraction (β=-0.008, p=0.008), the level of NT-proBNP (β=0.00003, p=0.006).

Conclusion: Associations were found between the presence and severity of CHF and BMD levels. Low P1NP values in patients with CHF, in contrast to the control group, indicate a predominant suppression of bone formation during bone remodeling. An increase in the CTx level with increasing severity of CHF indicates accelerated bone loss with the progression of CHF.

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PRIMARY CARE REHABILITATION AFTER KNEE REPLACEMENT – A CROSS-SECTIONAL SURVEY STUDY

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Background: Rehabilitation after knee replacement (KR) surgery is essential but high-quality guidelines are lacking. There is also a knowledge-gap regarding current rehabilitation modalities applied in primary care in Sweden. This study aimed to (I) describe physiotherapy management in primary care and (II) explore physiotherapists' perceptions of patients' challenges during rehabilitation following KR.
Methods: A cross-sectional, web-based survey was conducted among Swedish physiotherapists working in primary care. Questions were categorical or open-ended and related to current rehabilitation practices, treatment modalities, and physiotherapists' perceptions on patients' challenges in rehabilitation after KR. Data were described descriptively and open-ended answers were analysed with quantitative content analysis and categorised.
Results: In total, 202 physiotherapists answered the survey. Rehabilitation focused on home exercises with recurrent physiotherapy visits. Common treatment modalities were knee range of motion exercises, strength training, and stationary cycling. Key rehabilitation challenges included the following categories: Patients are unprepared, Challenging to find the optimal load, and Restore function and trust in the knee.
Conclusion: Rehabilitation after KR in Swedish primary care seems to be in line with previously recommended treatment modalities. According to the physiotherapists in this study, some of the key challenges that patients faced were severe pain and knee swelling, regaining function, balancing load/recovery and resuming physically demanding activities.

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ORGANIZATIONAL PREDICTORS OF HIGHER FRACTURE LIAISON SERVICE (FLS) PERFORMANCE IN ENGLAND AND WALES: THE RADIATE STUDY

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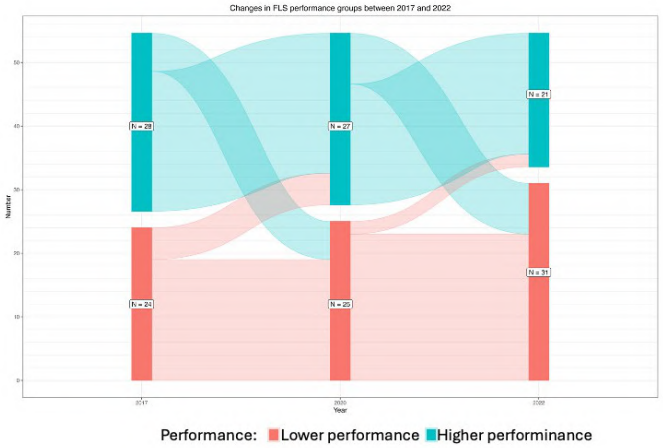
Objective:
To describe the organisational predictors of FLS performance as measured by key performance indicators (KPIs) in England and Wales.
Materials and Methods:
The submitted patient records to the FLS-DB of England and Wales from 2017 (n=52,731 patient records), 2020 (n=62,205), and 2022(n=65,844) were used to derive the KPI data were analysed to identify potential "high-performing" FLSs using K-means clustering. The optimal number of clusters was determined using the NbClust package. The organisational characteristics of the FLSs from the facilities audit (including fracture types identified, time to assessment, treatment recommendations, monitoring methods, work time by different FLS staff members per week, and the estimated caseload) were compared between the clusters by bootstrap logistic models. The organisational characteristics included the. Within cluster, associations were tested using Pearson correlations and linear regression models.
Results
61 FLSs were identified in 2017. The optimal number of clusters was two and remained relatively stable between 2017 and 2022 (Figure). The clusters differed ($p<0.002$) by KPI for DXA with 90 days, proportion recommended treatment, strength and balance testing, and follow-up measures. Of the FLS pathway parameters, monitoring by an FLS coordinator predicted higher performance, and delegating monitoring to primary care physicians predicted lower performance. Only in the higher performing cluster did FLS nurse & administrator time predict the number of patients submitted ($p<0.05$), and only administrator time significantly predict the number of patients initiating osteoporosis treatment within 16 weeks of fracture.
Conclusion
FLS performance was relatively stable before and after the COVID pandemic. How FLS delegate monitoring predicted better overall FLS KPI performance. The positive relationship between staff numbers and the number of cases submitted and initiating treatment was only seen in the higher-performing cluster, demonstrating the value of KPI in improving the efficiency of FLSs.



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REMS TECHNOLOGY FOR FRACTURE RISK ASSESSMENT IN KIDNEY TRANSPLANT PATIENTS

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Objective(s): Changes in bone quantity and quality are common consequences in Kidney transplant patient (KTP), who are at a significantly increased risk of fractures. A complex interplay of factors contributes to bone damage in KTPs, including immunosuppressive therapy and alterations in the parathyroid hormone-vitamin D-fibroblast growth factor 23 axis. The high fracture risk in KTPs is associated with increased morbidity, higher healthcare costs, hospitalizations, and mortality. Therefore, due to the substantial burden of this issue, assessing fracture risk and, consequently, implementing targeted early interventions and proper patient management are crucial. The aim of this study is to evaluate the 5-year fracture risk in KTP patients by using the non-invasive Radiofrequency Echographic Multi Spectrometry (REMS) technology.
Material and Methods: The 5-year fracture risk was calculated using a REMS-based algorithm that automatically combines information on both bone quantity and quality. Specifically, by combining the REMS T-score and the Fragility score (figure 1), 7 distinct risk classes are identified, each representing a different fracture risk probability. The R1 category represents the group with the lowest fracture risk probability, which increases progressively up to R7 for the category with the highest risk (figure 2).

Combining Matrix of REMS BMD and Fragility Score

REMS FRAGILITY SCORE Classification	REMS T-SCORE classification: NORMAL	OSTEOPENIA	OSTEOPOROSIS
NORMAL	R1	R3	R5
DECREASED	R2	R4	R6
LOW	R3	R5	R7

Figure 1

Total Fracture Risk at 5 years (‰)

Risk class	Risk of major osteoporotic fracture per 1000 subjects per 5 years
R1	≤ 5
R2	[5-10]
R3	[10-20]
R4	[20-35]
R5	[35-60]
R6	[60-100]
R7	> 100

Figure 2
Results: A total of 30 patients were enrolled (50-80 y; BMI 16-23 Kg/m^2, both genders). All participants underwent a lumbar spine REMS scan (L1-L4) to assess their fracture risk class. The KTPs were all classified into the high-risk categories R5-R6, indicating a 5-year fracture risk for major fractures of more than 60 ‰.
Conclusion(s): In conclusion, REMS technology enables the identification of high-risk individuals. The prevalence of R5-R6 cases in KTPs highlights the need for improved bone health monitoring and prevention strategies to reduce fractures and enhance quality of life.

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COMPARATIVE STUDY BETWEEN CONSERVATIVE AND EARLY KYPHOPLASTY TREATMENT FOR OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURES (OVCF) IN ELDERLY PATIENTS

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Objective.
The mean objective of this study is to analyse whether patients suffering of osteoporotic vertebral compression fractures are in need of less analgesia and show better functionality after early kyphoplasty as compared with the use of conservative therapy.
Materials and Methods.
We conducted a prospective observational study in our hospital. We included patients over 75 years old with OVCF. They were divided into 2 groups: patients that followed kyphoplasty surgical treatment within 4 weeks after vertebral fracture compared to patients treated nonoperatively. We included 50 patients per group. Demographic data, VAS, analgesic intake, ODI, were recorded. Follow up was 1 year.
Results.
100 patients were included. Most of the patients in the study were women with a mean age of 80,5 years. All vertebral fractures were acute and had imaging evidence of persistent bone edema. Mean VAS score at initial diagnosis was 8,8 in the surgical group and 8,5 in the conservative group. Three months after kyphoplasty VAS score had decreased to 2,4 while in the conservative group was 4,4 and, one year later, surgical group VAS score was 1,3 and conservative group VAS score was 1,8. Os-

westry disability Index (ODI) mean scores at initial diagnosis were 74% in the surgical group and 69,7% in the conservative group and after one year it was 15,4% and 31,6% respectively. The kyphoplasty group has a mean ASA score of 2,6, only 1 patient had to be hospitalised during 24 hours and cement leakage was detected in 4 patients without clinical repercussion.
Conclusions.
Faster pain and disability reduction was achieved with kyphoplasty treatment. At 1-year-follow up, non-surgical management group, had greater disability comparted to kyphoplasty patients. Early performance improves mobilization and decreases the complications associated to conservative treatment; therefore, it should be considered as first election treatment in very elderly patients.

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INFLUENCE OF PSYCHOEMOTIONAL DISORDERS ON THE OUTCOME OF SURGICAL TREATMENT OF VERTEBRAL COMPRESSION FRACTURES IN ELDERLY PATIENT

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Objetive
The overall objective is to analyze the difference in clinical results after surgical treatment in patients with TPE and a control group, as well as to generate a rapid diagnostic method to detect TPE.
Material and methods
It is a prospective study in 55 patients (23 with diagnosis of PDE and 32 without PED) with VCF treated by balloon kyphoplasty in which Visual Analogue Scale (VAS), Oswestry Disability Index (ODI) and analgesic medication were analyzed as study variables in successive visits (pre-surgery, one month after the intervention and one year later).
Results
Patients with TPE have less reduction in pain and disability and continue with analgesic treatment one year after treatment. There are no significant differences in gender, age or the number of complications between the groups.
Conclusions
Surgical treatment using kyphoplasty improves pain and disability in all patients but with worse results in patients with TPE. In these patients the results are similar to those obtained with conservative treatment, according to published meta-analyses.

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MUSCLE MASS ALTERATIONS IN PRIMARY SJÖGREN'S SYNDROME: A CROSS-SECTIONAL STUDY

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Background:
Primary Sjögren's syndrome (pSS) is an autoimmune disease that can lead to changes in body composition, particularly sarcopenia. This study aimed to describe the abnormalities in muscle mass in patients with pSS and to identify factors associated with sarcopenia.
Methods:
We conducted a monocentric cross-sectional study that included patients with pSS according to the 2016 ACR/EULAR criteria and a control group of age-matched patients without autoimmune or inflammatory diseases. Clinical and biological data were collected, as well as densitometric parameters for calculating the skeletal muscle mass index (SMI). Sarcopenia was defined as an SMI ≤ 5.5 kg/m².
Results:
We included 31 patients with pSS and 31 controls. The average age of pSS patients was 59±10 years [31-75], compared to 60±12 years [28-80] in the controls. The mean SMI was 6.21±0.85 kg/m² in the pSS group, with a sarcopenia frequency of 23%, compared to 6.01±0.59 kg/m² and 16% in the control group. No significant difference was observed between the groups regarding sarcopenia (p=0.52). Among sarcopenic patients, a significant difference was noted concerning pulmonary involvement, particularly interstitial lung disease (ILD) (p=0.03). Additionally, the rheumatoid factor (RF) was negative in sarcopenic patients and positive in 36% of non-sarcopenic patients (p=0.05). Sarcopenic patients also had a higher ESSDAI score (p=0.027), with 43% showing high activity. Significant differences were observed in densitometric parameters for fat mass index (FMI) (p=0.002) and bone mineral content (BMC) parameters: total BMC (p=0.018), femoral BMC (p=0.02), femoral T-score (p=0.014), and vertebral T-score (p=0.042). Multivariate analysis revealed that fat mass and BMC parameters, the presence of ILD, and corticosteroid use were positively correlated with sarcopenia, while RF positivity was negatively correlated.
Conclusion:
Our results confirm the presence of sarcopenia in 23% of pSS patients. Regular clinical assessments and cautious prescription of corticosteroids are essential.

P489

FAT MASS IN PRIMARY SJÖGREN'S SYNDROME: BEYOND BMI

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Introduction: Primary Sjögren's syndrome (pSS) is an autoimmune disease that may lead to alterations in body composition, particularly in fat mass. This study aimed to describe fat mass abnormalities in patients with pSS.
Methods: We conducted a monocentric cross-sectional study, including patients with pSS diagnosed according to the 2016 ACR/EULAR criteria, and a control group of age-matched patients without autoimmune or inflammatory diseases. Body mass index (BMI) and fat mass densitometric parameters were collected: fat mass index (FMI), fat-free mass index (FFMI), and the android/gynoid ratio.
Results: We included 31 patients with pSS and 31 controls. The average age of pSS patients was 59±10 years [31-75], compared to 60±12 years [28-80] in the controls. The mean BMI in the pSS group was 28±5 kg/m² [17-36]. Thirty-nine percent of the patients were obese, 35% were in overweight, 23% had a normal BMI, and 3% were underweight. The mean BMI in the controls was 27±4 kg/m² [20-37]. Fifty-eight percent of the controls were overweight, 16% were obese, and 26% had a normal BMI. A significant difference was found between the groups regarding BMI (p=0.03). The study group had significantly more cases of obesity (p=0.05). Regarding densitometric parameters, the mean FMI in the pSS patients was 11.8±4.7 kg/m² vs 11.6±3.2 in the controls. The mean FFMI in the cases was 15.9±1.9 kg/m² vs 15.2±1.4 kg/m² in the controls. The android/gynoid ratio was 1±0.2 in the cases vs 1±0.2 in the controls. No significant differences were observed between the groups for FMI (p=0.85), FFMI (p=0.13), or the android/gynoid ratio (p=0.56).
Conclusion: Our results showed that the average BMI is higher in pSS patients. However, no significant differences were observed between the two groups regarding densitometric fat mass parameters. Larger studies are needed to confirm these findings and explore potential links between body composition and disease progression in pSS.

P490

UNCOVERING BONE HEALTH IN PRIMARY SJÖGREN'S SYNDROME

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Introduction: Primary Sjögren's Syndrome (pSS) is an autoimmune disease that may lead to alterations in bone mineral content (BMC). This study aimed to investigate bone mineral density (BMD) abnormalities in patients followed for pSS.
Methods: We conducted a monocentric cross-sectional study including patients diagnosed with pSS according to the 2016 ACR/EULAR criteria, along with an age-matched control group without autoimmune or inflammatory diseases. Osteodensitometric parameters were collected for analysis.
Results: We included 31 patients with pSS and 31 controls. The mean age of the pSS patients was 59±10 years [31-75] versus 60±12 years [28-80] in the control group. Bone densitometry analysis revealed total BMC values estimated at 1.1±0.1 kg/m² in both groups (p=0.059). The total T-score was significantly higher in the pSS group (-0.1±1.3 SD) compared to the control group (-0.8±1.2 SD), with a statistically significant difference (p=0.02). No difference was observed between the groups regarding spinal BMC, which was 1±0.2 g/cm² in both groups (p=0.44). The spinal T-score was estimated at -1±1.5 SD in the pSS group and -1.6±1.4 SD in the control group, with no significant difference (p=0.40). For femoral BMC, values were 0.9±0.2 g/cm² in the pSS group and 0.9±0.1 g/cm² in the control group, with no statistically significant difference (p=0.27). The mean femoral T-score was similar between the groups, -1.2±1.2 SD and -1.4±1.2 SD, respectively, (p=0.63). Among the pSS patients, 42% were osteoporotic, and 29% presented osteopenia, while in the control group, 35% had osteoporosis and 35% had osteopenia.
Conclusion: Although significant differences were observed in total T-scores between pSS patients and controls, no significant differences were found for spinal and femoral T-scores. Further studies with larger sample sizes are needed to confirm these findings.

P491

DIFFERENCES IN THE FRACTURE RISK ASSESSED WITH FRACTURE RISK ASSESSMENT TOOL (FRAX) BETWEEN ELDERLY WOMEN WITH IMPAIRED AND UNIMPAIRED BALANCE

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Objective: FRAX tool used to assess fracture risk considers various clinical factors, but its relationship with balance, particularly in older women, is not well understood. This study investigates fracture risk differences, as assessed by the FRAX tool, between elderly women with impaired and unimpaired balance.
Material and Methods: Balance was assessed in 91 women using the Flamingo Test. Participants were instructed to stand on one

leg, lifting the opposite leg so that the foot was resting against the knee of the standing leg. They were required to maintain this position for 30 seconds. The test was considered successful if participants were able to complete the test without touching the ground with their lifted foot or hands. Differences in FRAX for major osteoporotic fractures (MOF) and for hip fractures (HF) were assessed in the groups with impaired and unimpaired balance. Data collection from the electronic health record was performed with an innovative JAVA tool, developed by Kirilov et al. (1,2)
Results: Out of 91 subjects, 52 women (57.1%) were with unimapaired balance and 39 women (42.9%) were with impaired balance. The mean age of the participants was 72 ± 6.1 years, and the mean BMI was 26.1 ± 5.2 kg/m². FRAX scores for MOF didn't differ significantly (p = 0.092) across balance groups. Women with impaired balance had higher mean FRAX score for MOF (18.24%), compared to those with unimapaired balance (15.92%). FRAX scores for HF showed significant differences (p = 0.004) among balance groups. Women with impaired balance had higher mean FRAX score for HF (6.22%), compared to those with unimapaired balance (4.02%).
Conclusion: Women with impaired balance had a higher risk of hip fractures (HF). These results suggest that balance impairment may be a key factor in hip fracture risk and highlight the importance of balance assessment in fracture risk evaluation.
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P492

FEASIBILITY AND ACCEPTABILITY OF A 12-WEEK VIRTUAL EXERCISE PROGRAMME FOR OLDER INFORMAL CAREGIVERS

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Objective : Older informal caregivers provide essential unpaid care but often face significant physical and mental strain. To improve their health and quality of life, a 12-week virtual exercise programme has been developed, offering flexibility via video-based sessions or printed booklets. This study aims to assess the acceptability and feasibility of the programme.
Material and Methods : In this randomised controlled trial, older informal caregivers (age ≥ 60 years) were divided into two groups: one accessed instructional videos (video group), the other used printed materials (booklet group). Each 30-minute session included a warm-up, main exercises, and a cool-down. **Acceptability** (***adherence*** and ***satisfaction*** using a 4-point Likert scale) and **feasibility** (perceived ***difficulty*** using a 4-point Likert scale and ***usability*** via the validated SUS questionnaire) were assessed post-intervention. Expected values were 80% adherence and satisfaction, SUS scores ≥ 68/100, and < 40% difficulty.
Results : Currently, 26 caregivers participated (video group: n=13; booklet group: n=13). Participants were mostly women (65.4%), with a mean age of 69.9 ± 6.01 years. The video group demonstrated higher ***adherence*** (81.5%, 10.6 ± 1.63 sessions completed) compared to the booklet group (76%, 9.13 ± 1.83 sessions, p=0.04). ***Satisfaction*** levels were similar in both groups, with all participants reporting being satisfied or highly satisfied. ***Usability*** was higher in the video group (SUS = 84.1 ± 8.19) versus the booklet group (SUS = 77.1 ± 4.91, p = 0.002). Perceived ***difficulty*** was mostly moderate or easy in both groups, but a small portion (12.5%) of the booklet group found the exercises difficult.
Conclusion : The virtual programme is feasible and acceptable for older caregivers, with video-based sessions showing slightly better adherence and usability. The study aims to increase the sample size to 82 participants and will next explore the programme's impact on physical and mental health.

P493

PHARMACOKINETIC SIMILARITY OF CANDIDATE BIOSIMILAR AVT03 (60 MG/ML) AND REFERENCE PRODUCT DENOSUMAB

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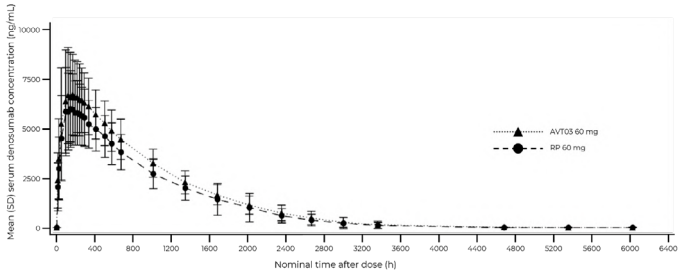
Objective
Assess PK similarity of AVT03 (60 mg/mL), a proposed denosumab biosimilar, and reference product (RP; 60 mg/mL) in healthy adult males (NCT05126784).
Materials and Methods
A 36-week, randomized (1:1), double-blind, 2-arm, parallel-group study. Participants were randomized and received one 60 mg dose of AVT03 (n = 99) or RP (n = 107) SC on Day 1. Randomization was stratified by body weight. Primary endpoints were C_{max} and $AUC_{0\text{-}inf}$. Additional PK parameters included $AUC_{0\text{-}t}$, $AUC_{0\text{-}24}$, T_{max}, K_{el}, $t_{1/2}$, V_z/F, and CL/F.
PD parameters included $AUEC_{0\text{-}t}$ and I_{max} for sCTX-1.
Safety endpoints included incidence of treatment-emergent adverse events (TEAEs), and levels of calcium, PTH, and vitamin D. Immunogenicity endpoints included (ADAs) and neutralizing antibodies (NAbs).
Results
The 90% CIs for the geometric mean ratio for the primary PK parameters were entirely contained within the prespecified margins of 80.00% and 125.00% (C_{max} [102.231, 113.642]; $AUC_{0\text{-}inf}$ [107.169, 118.874]), supporting demonstration of PK similarity. There were no notable differences in subgroups. Additional PK parameters were comparable across treatment groups.
The $AUEC_{0\text{-}t}$ profiles for percentage change from baseline in sCTX-1 were comparable between treatment arms. Geometric mean values for sCTX-1 I_{max} were similar across treatment groups (AVT03,

91.37%; RP, 92.28%).
A similar percentage of participants reported TEAEs in both treatment arms (AVT03 75.8%; RP 73.8%). Changes over time in calcium, PTH, and vitamin D levels were comparable in both treatment arms. Immunogenicity profile was similar between treatment groups.

Conclusion

Analysis of the 90% CIs for the GMRs of the primary endpoints supports demonstration of PK similarity between 60 mg/mL AVT03 and RP. PD profiles were similar. Safety and immunogenicity profiles were comparable.

Serum Denosumab Concentrations



P494

PHARMACOKINETIC SIMILARITY OF CANDIDATE BIOSIMILAR AVT03 (70 MG/ML) AND REFERENCE PRODUCT DENOSUMAB

F. Bullo[1], L. Jaskiewicz[1], S. Stamatakos[1], A. Sattar[1], H. Otto[1], M. Rai[1], S. Leutz[1], F. Berti[1]

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Objective

Assess PK similarity of AVT03 (70 mg/mL), a proposed denosumab biosimilar, and reference product (RP; 70 mg/mL) in healthy adult males (NCT05876949).

Materials and Methods

A 28-week, randomized, double-blind, 2-arm, parallel-group study. 208 participants, including 24 (11.7%) Japanese, were randomized 1:1 to receive one 120 mg dose of AVT03 (n = 104) or RP (n = 104) subcutaneously on Day 1. Randomization was stratified by body weight and ethnicity. Primary endpoints were C_{max} and $AUC_{0\text{-}t}$. Additional PK parameters included $AUC_{0\text{-}inf}$, $AUC_{0\text{-}24}$, T_{max}, K_{el}, $t_{1/2}$, V_z/F, and CL/F.
Safety endpoints included incidence of treatment-emergent adverse events (TEAEs), and levels of calcium, PTH, and vitamin D. Immunogenicity endpoints included frequency of anti-drug antibodies (ADAs), and frequency of neutralizing antibodies (NAbs).

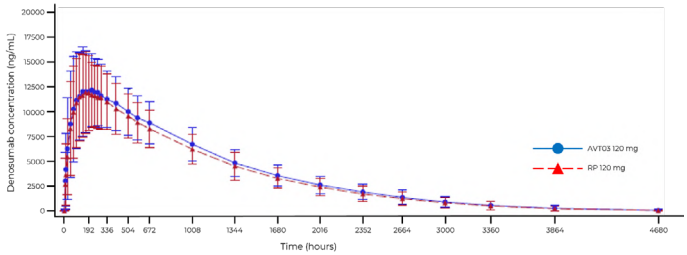
Results

Mean serum concentration-time profiles for AVT03 and RP were comparable over the PK sampling duration. The 90% CIs for the ratio of geometric means for the primary PK parameters were entirely contained within the prespecified margins of 80.00% and 125.00% (C_{max} [98.26, 110.00]; $AUC_{0\text{-}inf}$ [102.30, 113.60]), supporting demonstration of PK similarity. There were no notable differences in subgroups and consistency between the Japanese participants and the overall population was shown. Additional PK parameters were comparable across treatment groups.
The percentage of participants who reported TEAEs in the AVT03 group (63.5%) was similar to RP group (64.4%). Changes over time in calcium, PTH, and vitamin D levels were comparable in both treatment arms. Immunogenicity profile was similar between treatment groups.

Conclusion

Analysis of the 90% CIs for the GMRs of the primary endpoints supports demonstration of PK similarity between 70 mg/mL AVT03 and RP. AVT03 had a safety and immunogenicity profile comparable to RP.

Serum Denosumab Concentration



P495

COMPARATIVE EFFICACY AND SAFETY OF CANDIDATE BIOSIMILAR AVT03 AND REFERENCE PRODUCT DENOSUMAB

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Objective

To demonstrate comparative efficacy of AVT03, proposed denosumab biosimilar, and reference product (RP) in postmenopausal women with osteoporosis (NCT05395091).

Material and Methods

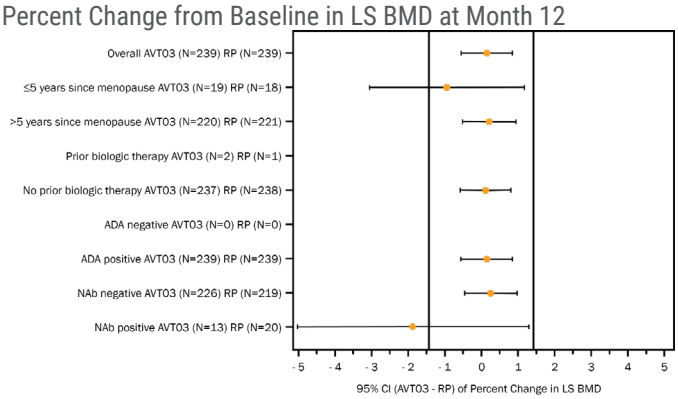
This is an 18-month, randomized, double-blind, parallel group study. Participants received AVT03 (n = 266) or RP (n = 266); 60 mg SC on Day 1 and Month 6. At Month 12, participants received a third dose of AVT03 or were re-randomized to receive a third dose of RP or switch from RP to AVT03. Randomization was stratified by years since menopause and prior biologic therapy. Primary endpoints were percent change from Baseline in LS BMD at 12 months and $AUEC_{0\text{-}6months}$ of %Cfb sCTX-1.
Safety endpoints included incidence of treatment-emergent adverse events (TEAEs). Immunogenicity endpoints included frequency of anti-drug antibodies (ADA) and neutralising antibodies (NAb).

Results

The 95% CIs of the LS means difference between treatment arms for percent change from baseline in LS BMD to Month 12 (-0.58, 0.82) were entirely contained within the prespecified margin (-1.45%, 1.45%), supporting demonstration of comparative efficacy. There were no notable differences in subgroups.
The 95% CIs of the geometric mean ratio between treatment

arms for $AUEC_{0\text{-}6months}$ of %Cfb sCTX-1 (0.97, 1.03) were entirely contained within the prespecified margin (0.80, 1.25), supporting demonstration of PD similarity.
At Month 12, a similar percentage of participants reported TEAEs in both treatment arms (AVT03 66.5%; RP 66.9%). Comparable profile persisted through Month 18. Immunogenicity profile was comparable between treatment groups to Month 12, persisting to Month 18.
Conclusion
Analysis of the primary endpoints supports a demonstration of comparative efficacy between AVT03 and RP. Safety and immunogenicity profiles were similar to Month 18, including in those who switched treatment.

Percent Change from Baseline in LS BMD at Month 12



P496

MEDICAL TREATMENT IN COMBINATION WITH OCCUPATIONAL THERAPY, EFFECTIVENESS IN PREVENTION OF FRACTURES IN ELDERLY WOMEN AFFECTED BY BREAST CANCER

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Objective: prevention of Osteoporosis is a major objective in the management of patients treated for breast cancer with aromatase inhibitors. Denosumab proved effective in prevention of fractures in subjects whose breast cancer was treated with aromatase inhibitors. This study focused on the effectiveness of medical treament with a self sufficient occupational therapy project to be carried out at home.
Methods: 12 elderly patients affected by breast cancer were followed for 12 months. After surgery they were treated with aromatase inhibitors combined with Denosumab so to prevent fractures. From T0 to T24 the design of the study included: 1) blood tests; 2) spine and femur bone density scan DEXA; 3) lumbar dorsal spine morhometry; 4)short physical performance battery (SPPB). SPPB evaluates physical performance whose level scores between 0 and 12. In 6 patients (Group A) we evaluated the effectiveness of Denosumab treament on osteoporosis prevention, while in group B 6 more patients were treated with a combination of Denosumab and occupational therapy for effectiveness. Subjects were instructed on how to perform specific excercises on their own for 12 months following a series of increasingly demanding excercises performed three times a day for 20 minutes.
Results: Group A patients (mean age 72 ± 3 years) had an average SPPB score 7 (p 0.05) at T0. Group B patients (mean age 71±4 years) had an average SPPB score 7 (p 0.05). At T 24 group A patients average SPPB score was 9 (p 0.05) showing an improvement in gait rate. At T24 group B patients had a an average SPPB score 10 (p 0.05) showing improvement in balance & gait rates.
Conclusion: This study proved the effectiveness of combined treatment with Denosumab and occupational therapy in elderly patiens affected by breast cancer treated with aromatase inhibitors after surgery, in order to control severity markers, prevention of fracture risk and improvement of physical performance.

P497

RETROSPECTIVE ANALYSIS TO ASSESS IMPROVED IDENTIFICATION OF VERTEBRAL FRAGILITY FRACTURES ON CHEST X-RAY IN A UK CANCER HOSPITAL

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Objective:
Vertebral fragility fracture (VFF) is the most common osteoporotic fracture with up to 70% under-reported by radiologists [1,2]. Cancer patients have an increased risk of VFF. The objective of this study was to evaluate the utility of artificial intelligence (AI) assisted interpretation for increased detection of vertebral fracture on chest X-ray (CXR).
Material and Methods:
An AI-driven computer aided detection (CAD) device (Annalise Container v2.2) was used to evaluate all CXRs performed over a 1-month period (n=1,669) at The Christie NHS Foundation . Of all studies evaluated, 955 (57%) included a lateral projection, routinely performed in our institution. The AI device flagged 100/955 (10.5%) lateral CXRs as containing a VFF. All studies flagged were reviewed by 5 reporters (reporting radiographers & consultant radiologists) who independently graded each study retrospectively for visibility of the fracture with the AI output.
Results:
There was 100% concordance with the AI classification for 76/100 studies. There were only 4/100 studies where there was 100% discordance with AI, however the confidence bars for the AI output was low for each of these studies. There was no mention in the report of fracture for 34 of the studies flagged by the AI. 23/34 (67.6%) of the studies without mention of the fracture in the report had ≥ 80% consensus with AI for presence of VFF on retrospective review of the lateral image.
Conclusion:
VFF are frequently underreported in clinical radiology. This missed opportunity can have a critical impact on patient morbidity and quality of life [2] with a significant cost-burden to the NHS.

Incorporating AI support tools when reviewing CXR studies (specifically those with a lateral projection) can enhance detection of VFF and has potential to improve/automate fracture referral pathways. Early identification of VFFs is critical to ensure patients are appropriately managed and offered preventative and cost-effective treatments where appropriate.

References

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[2] Clinical Guidance for the Effective identification of Vertebral Fractures - Royal Osteoporosis Society, 2017

P498

DIFFERENTIAL ANALYSIS OF LUMBAR SPINE BONE MINERAL DENSITY AND TRABECULAR BONE SCORE IN HYPOPHOSPHATASIA PATIENTS WITH BIALLELIC VS MONOALLELIC ALPL GENOTYPE

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Objective

Hypophosphatasia (HPP) is a genetic disorder marked by deficient Alkaline Phosphatase activity. Depending on genotype severity, this causes multiple extraskeletal manifestations and impaired bone mineralization. Dual-energy X-ray absorptiometry (DXA), which measures bone mineral density (BMD), has limitations in assessing bone quality in conditions like HPP, Trabecular bone score (TBS), derived from DXA images, enables an advanced evaluation of vertebral bone microarchitecture and mineralization homogeneity, to offer additional insights into bone quality in such conditions. This study aimed to compare lumbar spine BMD and TBS parameters in HPP patients with biallelic vs monoalleic ALPL variants.

Materials and Methods

In this retrospective, single center, matched-pairs analysis, lumbar spine DXA scans from 90 HPP patients with biallelic (n=45) vs monoallelic (n= 45) ALPL variants an no previous enzyme replacement therapy , were analyzed. Lumbar spine (L1-L4) BMD and TBS [version 3 (body mass index- adjusted) and version 4 (tissue thickness adjusted)] were assessed.

Results

Overall average values for age (49.6±14.0years), height (166.5±10.6cm), weight (74.5±17.4kg), BMI (26.9±6.0kg/m²) and tissue thickness (19.3±3.1 cm) were not significantly different between the groups.. Mean LS-BMD T-scores was normal (+0.1±2.3) but patients with biallelic variants had higher BMD (+0.88±2,22) than heterozygously affected patients (-0.70±2.06; p<0.001). Conversely, TBS T-scores were low in both cohorts 1.10 (±1.73) vs -1.48 (±1.60) for biallelic vs. monoallelic genotype, respectively (p=0.074). The more recent TBS software version 4 appeared even more sensitive to detect deterioration in both groups, with TBS T-scores of -1.40 (±1.17) vs -1.73 (±1.34) in the two groups respectively (p = 0.64).

Conclusions

In line with previous findings, this study indicates that conventional DXA-BMD may appear erroneously high in HPP patients, particularly in more severe biallelic cases where elevated BMD T-scores may mask skeletal defects. Extended analysis using TBS exhibited inferior bone microarchitecture and mineralization inhomogeneity in both, biallelic and monoallelic HPP genotypes. This underscores potential added value of TBS in evaluating skeletal involvement in HPP with the newer version 4 showing greater sensitivity.

P499

PREVALENCE OF SARCOPENIA IN CKD: INSIGHTS INTO THE ROLE OF NUTRITION AND DIALYSIS

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Objective

To compare the prevalence of sarcopenia, body composition, and nutritional intake between patients on dialysis and those with conservatively managed chronic kidney disease (CKD) in stages IV and V, including individuals with End-Stage Renal Disease (ESRD).

Material and Methods

A total of 92 dialysis patients (DP) were included, consisting of 65 men and 27 women, along with 36 conservatively treated CKD patients. Sarcopenia was defined using bioimpedance analysis to calculate the Appendicular Skeletal Muscle Index (ASMI, appendicular muscle mass [kg]/height^2 [m^2]). Sarcopenia was defined as ASMI values <7 kg/m² for men and <5.5 kg/m² for women. Body composition metrics such as BMI, ASMI, lean mass, and fat mass were measured, and nutritional intake was assessed using food frequency questionnaires to understand caloric and protein intake patterns.

Results

Among dialysis patients, the distribution of BMI revealed that 12% had a BMI <18.5 (underweight), 47.8% had a BMI between 18.5 and 25 (normal weight), 30.4% had a BMI between 25 and 30 (overweight), and 9.8% had a BMI >30 (obese). Concerning nutritional intake, only 53.5% of DP met the recommended caloric target of 25 kcal/kg/day, while just 17.4% achieved the ideal protein intake of 1.2 g/kg/day. These findings suggest a notable gap in the nutritional requirements of dialysis patients. Sarcopenia was significantly more prevalent in DP (78.2%) compared to conservatively treated patients (52.8%) (p=0.004), and within the DP group, it was more common in men (87.7%) than in women (55.6%) (p<0.001). Sarcopenic DP (n=72) had lower ASMI (5.83±0.8 vs. 6.68±1.1 kg/m², p=0.003), lean mass (15.9±1.6

vs. 17.2±2.3 kg/m², p=0.027), fat mass (6.9±2.7 vs. 10±3.8 kg/m², p=0.002), and BMI (22.8±3.6 vs. 26.9±5.2 kg/m², p=0.001). Sarcopenic DP had lower protein intake normalized to caloric intake compared to non-sarcopenic patients (34.4±6.4 vs. 38.8±7.2 g/1000 kcal, p=0.016), whereas carbohydrate and lipid intake did not differ.

Conclusions

Sarcopenia is more prevalent and severe in DP compared to conservatively treated CKD patients, particularly in men. It is associated with low dietary protein intake relative to caloric intake. Early screening for sarcopenia, along with targeted nutritional support, is essential to mitigate muscle loss and improve prognosis in DP.

P500

PREVALENCE AND BURDEN OF OSTEOARTHRITIS AMONGST OLDER PEOPLE IN COLOMBIA

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Objectives: To investigate the prevalence of osteoarthritis (OA) and to identify the inequalities in person-level risk factors among older men and women in Colombia.

Material and methods: This cross-sectional study used data from the National Survey of Health, Wellbeing and Aging in Colombia (SABE Colombia, according to its initials in Spanish), a nationwide study conducted between 2014-2016. The study included a population-based study of 23694 people aged > 60 or older (median: 70.8 years, 57.3% women) living in rural and urban communities. Logistic regression was used to determine associations between the presence of OA and a range of sociodemographic, health-related, functional, and social/environmental variables.

Results: The overall prevalence of OA was 26% (women-36.5%; men-14.9%) See table 1. Prevalence increased with age and in mestizo ethnicity placed in urban areas. On multivariable analysis, OA was significantly associated with older age, female gender, multimorbidity, fair/poor self-perceived health, higher body mass index (BMI), higher LDL-c, a greater number of physical limitations, and perceived safety/security problems in the neighborhood. In particular, there was a strong association between multimorbidity and the presence of OA (OR = 4.97 (95% CI 4.46, 5.53)).

Conclusions: OA is a common and multifaceted condition, with a comparable prevalence of self- reported OA in Colombia with similar populations elsewhere. Assessment and management should focus on potentially modifiable factors such as BMI, multimorbidity, physical limitations, mobility disabilities, and safety/security problems in the neighborhoods. More research is required to understand the complex inter- relationships between these and other risk-associated variables

Table 1. Prevalence of OA by Age SABE Colombia.

	Total		Men		Women	
Age (years)	%	CI 95%	%	CI 95%	%	CI 95%
60 – 64	19.8	(18.0 – 21.7)	10.3	(8.2 – 12.9)	29.3	(25.8 – 33.2)
65 – 69	24.7	(20.4 – 29.6)	12.1	(9.1 - 16.1)	36.5	(30.9 – 42.5)
70 – 74	26.6	(23.2 – 30.2)	17.1	(14.2 – 20.5)	36.7	(31.8 – 42.0)
75 – 79	32.8	(28.0 – 38.0)	19.6	(16.1 – 23.6)	45.2	(38.8 – 51.8)
80 – 84	34.3	(29.9 – 38.9)	20.0	(15.3 – 25.6)	46.2	(39.9 – 52.6)
85 and over	34.9	(27.9 – 42.7)	29.5	(18.6 – 43.4)	40.3	(33.1 – 47.9)
Total	25.8	(23.8 – 28.0)	14.9	(13.3 – 16.7)	36.5	(33.2 – 39.9)

P501

EVALUATION OF THE ACCURACY OF OPERA AND OSTA FOR OSTEOPOROSIS SCREENING IN WOMEN OVER 50 YEARS IN IRAN

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Objective:

Identifying an appropriate screening tool for osteoporosis is essential for its integration into the health system's osteoporosis program. The aim of this study was to assess the accuracy of OPERA and OSTA in in Women Over 50 Years in Iran.

Method

This diagnostic test study was conducted in 2022 in Hamedan province in Iran. Participants included females over 50 years old who visited health centers and filled out informed consent. Before their visits, public announcements were made in communication channels to invite population to participate in this study. The OPERA and OSTA screening tools were filled for participants, and bone densitometry, considered the gold standard, was performed

to evaluate osteopenia and osteoporosis in the femoral neck, total hip, and spine. Bone mineral density (BMD) was measured using the DXA method with a GE Lunar device. Osteoporosis and osteopenia were defined as a T-score of less than -2.5 and -1, respectively, in at least one of the three mentioned regions. The sensitivity and specificity of OPERA and OSTA, in combination (a positive result in either test considered as positive), were assessed for screening osteopenia/osteoporosis and osteoporosis.
Results
In this study, a total of 998 female participants were included. The mean age and BMI of participants were 71.67 ± 6.33 years, and 26.74 ± 4.53. The sensitivity and specificity of OPERA/OSTA for detecting osteoporosis for the femoral neck were 87.27% and 38.87%, for the total hip were 90.16% and 37.85%, for the spine were 83.19% and 44.52%, and for patients with at least one site of osteoporosis were 81.41% and 45.09%, respectively.
In addition, the sensitivity and specificity of OPERA/OSTA for detecting osteopenia or osteoporosis for the femoral neck were 73.13% and 54.98%, for the total hip were 77.23% and 51.45%, for the spine were 73.76% and 58.82%, and for patients with at least one site of osteopenia or osteoporosis were 70.62% and 65.29%, respectively.
Conclusion
The combined use of OPERA and OSTA tools is more sensitive and has better performance for screening of osteopenia or osteoporosis compared to using these tools for screening of osteoporosis. However, the specificity was low in this method, and false positive effects should be considered. However, the use of these tools is appropriate for screening purposes.
Keywords: Osteoporosis, Screening Tools, Sensitivity, Specificity, OPERA, OSTA, Bone Densitometry.

P502

TIME-EFFICIENT MRI SCORING SYSTEM FOR AXIAL SPONDYLOARTHRITIS: A PROSPECTIVE VALIDATION STUDY

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Background: Axial spondyloarthritis (axSpA) is a chronic degenerative condition that primarily affects the spine and sacroiliac joints (SIJs), leading to significant suffering. It falls under the broader category of spondyloarthritis, which presents a considerable diagnostic challenge owing to nonspecific symptoms and a notable lack of radiographic evidence in the early stages of the disease [1].
Magnetic resonance imaging (MRI) has become an indispensable diagnostic tool for evaluating axSpA that can detect both active inflammation and structural changes in the SIJs and spine, especially when inconclusive results arise from other modalities. It is the standard imaging modality recommended for the assessment of axSpA, as supported by the ankylosing spondylitis Working Group of the International Association for the Assessment of Spine Arthritis (ASAS) and Outcome Measures in Rheumatoid Arthritis Clinical Trials (OMERACT) [2]. Various MRI scoring systems are in use, with the Spondyloarthritis Research Consortium of Canada (SPARCC) score being notably sensitive in detecting subtle changes in inflammation and correlating positively with clinical measures of disease activity [3].
Despite advancements in the management of axSpA, the absence of standardized methods for routinely assessing disease activity remains a significant challenge. The current SPARCC MRI score, although valuable, is time-consuming and requires specialized training, taking between 40 min to 1 h per patient, depending on individual conditions. To address these limitations, we proposed a simple SPARCC MRI score that focuses on the three most affected slices of the SIJs and the three most affected vertebrae in the spine. This approach offers a more streamlined and time-efficient method for clinical practice.
Objective: To develop and validate a simplified Spondyloarthritis Research Consortium of Canada (SPARCC) MRI score for detecting disease activity changes in patients with axial spondyloarthritis (axSpA) undergoing biological therapy and compare its performance with the original SPARCC score.
Methods: This prospective study included 60 patients with axSpA diagnosed according to the ASAS classification criteria who were naïve to biologic DMARDs. Disease activity and physical function in axSpA patients were assessed using several indices at baseline and six months after biological therapy. Improvement was defined as either an ASDAS-Clinically Important Improvement (ASDAS-CII) (a decrease of ≥ 1.1) or ASDAS-Major Improvement (ASDAS-MI) (a decrease of ≥ 2.0).
MRI examinations of the sacroiliac joints (SIJs) and spine were performed at baseline and six months after biological therapy. The simplified SPARCC score, focusing on the three most affected slices/vertebrae instead of six, was developed and compared with the original SPARCC score. Both original and simplified SPARCC scores were correlated with clinical indices and inflammatory markers (CRP and ESR). Inter-reader agreement and diagnostic performance were evaluated to assess reliability and clinical utility.
Results: The study included 60 axSpA patients with mean age of 29.78 ± 7.28 years, with male predominance (68.3%) . Median disease duration was 4 years (0.5-10). 45% of the patients had peripheral arthritis, 15% had psoriasis, 5% had inflammatory bowel disease and 3.3% had uveitis. HLA-B27 was positive in 43.3%. By comparing various disease activity markers and clinical scales at baseline and 6 months post-therapy; all parameters showed significant improvement ($p<0.001$) (median ESR decreased from 35.0 to 12.0, CRP from 17.5 to 2.0, BASDAI from 7.0 to 2.0, BASFI from 6.0 to 2.0, and BASMI from 4.0 to 2.0). Mean ASDAS-CRP decreased from 4.02 to 1.91. ASDAS-CRP "very high" activity decreased from 73.3% to 10%, while 38.3% achieved "inactive" status. A thorough comparison between the original and simple MRI SPARCC scores at baseline and six months after biological

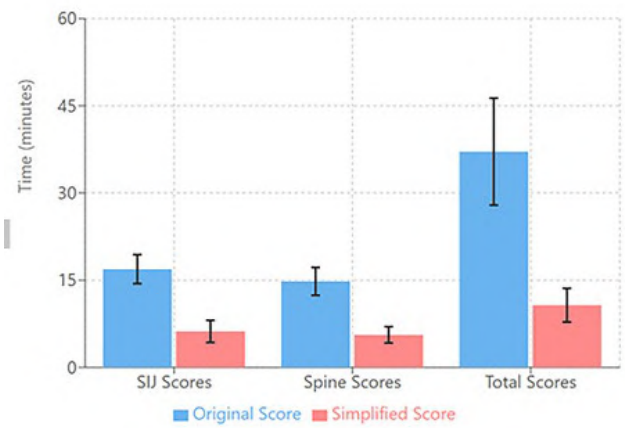
therapy is summarized in Table 1.
Table 1.

Variables	Baseline (n=60)	Follow-up (n=60)	% of improvement	P-value
Original SPARCC SIJ	22 (21.3), 4 – 56	6 (10.5), 0 – 23	73.8	<0.001
Simple SPARCC SIJ	19 (20.5), 4 – 36	6 (9.25), 0 – 21	71.4	<0.001
Original SPARCC spine	13 (16.3), 0 – 51	1.5 (10), 0 – 22	78.8	<0.001
Simple SPARCC spine	11.5 (15.25), 0 – 47	1.5 (8), 0 – 18	79	<0.001
Original SPARCC total	36.5 (36.5), 5 – 101	6 (17), 0 – 45	75.5	<0.001
Simple SPARCC total	21 (25), 0 – 69	3 (16), 0 – 30	79.1	<0.001

Both the original and simplified SPARCC scores showed significant improvement after six months of biological therapy (p<0.001). The simplified SPARCC scores demonstrated strong correlations with disease activity markers, comparable to or stronger than the original scores. BASDAI and ASDAS showed strong correlations with both systems. BASDAI correlated with original (r=0.421) and simple (r=0.413) scores at baseline. ASDAS correlated with original (r=0.419) and total scores (r=0.425). Simple SPARCC total scores had the best diagnostic accuracy for detecting the disease activity (AUC 0.810, sensitivity 76.3%, specificity 66.7% at cut-off 9.0). Original SPARCC SIJ and total scores performed similarly (AUC 0.794, sensitivity 75%, specificity 82.7% at cut-offs 12.0 and 24.0). Spine scores showed high sensitivities (87.5-89.5%) but lower specificities (67.3%).

Inter-reader agreement was substantial to almost perfect for all scores, with simplified SPARCC spine score exhibiting highest agreement (κ= 0.817 at baseline and 0.784 at follow-up) followed by simple total scores (k=0.716 baseline, k=0.744 follow-up). Simple scores consistently outperformed original SPARCC across all categories.

The simplified scoring significantly reduced assessment time (Fig. 1): SIJ scoring from 16.9 ± 2.5 to 6.2 ± 1.9 minutes, spine from 14.8 ± 2.4 to 5.6 ± 1.4 minutes, and total from 37.1 ± 9.2 to 10.7 ± 2.9 minutes (all p<0.001).



Conclusion: This study supports the construct validity of the simplified SPARCC MRI score in assessing inflammation in patients with axSpA. The simplified SPARCC MRI score demonstrates comparable efficacy to original score in assessing disease activity in axSpA patients, with advantages of improved inter-reader reliability and significantly reduced assessment time.

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P503

OPTIMIZING BONE HEALTH BEHAVIORS IN OLDER ADULTS THROUGH A PARTICIPATORY APPROACH: A FUTURE PERSPECTIVE FOR LOW- AND MIDDLE-INCOME COUNTRIES

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Objective: The objective was to develop educational manuals on bone health for primary healthcare services in Albania, focusing on the older population. The goal was to enhance healthcare personnel's preparedness and confidence in educating patients about bone health, particularly concerning nutrition and physical activity.

Materials and Methods: The study followed a mixed-methods approach, beginning with a literature review on bone health behaviors tailored to older adults with chronic conditions. This review served as the foundation for creating educational materials. The first phase involved developing these materials for both healthcare professionals and older patients. In the second phase, the materials were tested in a pilot group of nine older individuals with musculoskeletal diseases. A ninety-minute focus group discussion was held to evaluate the clarity of the materials, identify any ambiguities in language, and assess the patients' understanding. Based on feedback, the educational material was refined. In the third phase, a focus group of twelve healthcare professionals (doctors and nurses) discussed the revised materials. Their input, along with insights into the Albanian healthcare context, helped finalize the content, ensuring that it was culturally appropriate, easily understandable, and practical for use by both patients and healthcare providers.

Results: The manuals were highly appreciated by both patients and healthcare professionals. Patients found the materials to be clear, relevant, and easy to integrate into their daily routines. They particularly appreciated the inclusion of visual aids, which made

the content more understandable. Both patients and healthcare professionals recognized that nutrition and physical activity—key elements of bone health—were often neglected in health education. This feedback emphasized the importance of including these topics in the manual. In the end, the content of the two manuals for osteoporosis and fall risk prevention was validated, and approval for use in clinical practice was obtained.

Conclusions: The participatory approach used in developing these educational materials was found to be effective in creating content that was relevant, understandable, and useful for improving bone health behaviors in older adults. Findings highlight the need for active collaboration between healthcare providers, patients, and the community in promoting bone health, particularly for older adults.

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RELATIONSHIPS BETWEEN PAIN, PHYSICAL ACTIVITY AND SLEEP QUALITY AMONG INDIVIDUALS WITH RADIOGRAPHIC KNEE OSTEOARTHRITIS: FINDINGS FROM THE HERTFORDSHIRE COHORT STUDY

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Objective
The Hertfordshire Cohort Study, a cohort of community-dwelling older adults, was used to characterise the importance of physical activity in the established relationship between sleep and osteoarthritis (OA).
Materials and Methods
Participants completed a questionnaire including: the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC); the Pittsburgh Sleep Quality Index (PSQI); Longitudinal Aging Study Amsterdam Physical Activity Questionnaire (LAPAQ); and the Hospital Anxiety and Depression (HAD) Scale. Knee radiographs were taken and classified according to Kellgren and Lawrence (K&L) criteria; analyses were restricted to individuals with radiographic knee OA (K&L score ≥2 on either knee). 81 men and 88 women were included, aged 71-80.
Logistic regression was used to examine the association between the WOMAC knee pain score and poor sleep quality (PSQI>5) with adjustment for sex, age, and anxiety and depression scores; analyses were performed with and without stratification by physical activity category (bottom sex-specific tertile vs not).
Results
Knee pain prevalence (WOMAC score > 0) was 40.7% among men and 46.6% among women; 37.0% of men and 50.0% of women reported poor sleep quality (PSQI>5). Higher WOMAC knee pain scores were related to higher odds of poor sleep quality. For example, the odds ratio (95% CI) for having poor sleep quality per unit increase in WOMAC knee pain score was 1.15 (1.01,1.32), p=0.038. Relationships were similar in men and women, and across physical activity subgroups. Associations were similar in sensitivity analyses after removing those with more severe OA (K&L score ≥3).
Conclusions
In this cohort of older people with radiographic knee OA, sleep disturbance was common. We found associations between higher levels of reported knee pain and poorer sleep quality. These relationships did not differ according to physical activity level. Future work on larger populations, and among younger people who may be more physically active, is now required.

P505

A PRAGMATIC APPROACH TO DETERMINING PREVALENCE OF OSTEOARTHRITIS IN THE GAMBIA AND ZIMBABWE

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Objective
To determine the prevalence of osteoarthritis (OA) in men and women in Zimbabwe and The Gambia.
Method
A population-based, cross-sectional study of community dwelling adults was conducted in urban Zimbabwe & The Gambia. Recruitment was sex- and age-stratified (40-54, 55-69, ≥70 years). The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) determined the prevalence of hip and knee pain (Stair climbing was removed as many dwellings lack stairs; so scored /16 rather than /20. Sex-stratified knee and hip pain prevalence was quantified, as WOMAC score ≥ 1. Descriptive statistics are presented as mean(SD) or median(IQR).
Results
The Gambia: 546 males(M) (mean age 60.7y (SD 13.0)) and 669 females(F) (mean age 60.7y (SD 12.7)) were recruited: mean BMI 23.6(SD 4.0)kg/m^2 in M and 28.0(SD 6.1) kg/m^2 in F. 32.9% of F and 5.7% of M were obese (BMI >30 kg/m^2). The prevalence of knee and hip pain was 57.5% and 41.6% in M and 72.3% and, 61.2% in F, respectively. The median WOMAC score for knee pain for M was 1(IQR 0-6) and for F was 3(IQR 0-7). Median WOMAC for hip pain for M was 0(IQR 0-4) and for F was 2(IQR 0-6).
Zimbabwe: 528 M (mean age 62.7y (SD 14.55)) and 560 F (mean age 62.7y (SD 13.74)) were recruited: mean BMI 23.1(SD 4.3)kg/m^2 in M and 28.7(SD 6.3)kg/m^2 in F. 37.5% of F and 6.4% of M were

obese. The prevalence of knee and hip pain was 27%, and 14.4% in M and 33.2% and 19.5% in F, respectively. The median WOMAC score for knee pain for M was 0(IQR 0-0) and for F was 3(IQR 0-7). For hip pain the median WOMAC for M and F was 0(0-0).
Conclusion
Adults in Zimbabwe and The Gambia have a significant burden of hip and knee pain. Aligning with global trends, women have more pain than men. Pain was more common in The Gambia than in high-income countries. Given the health and societal burden associated with OA and musculoskeletal pain, it will be important to determine context-specific risk factors and impact on quality of life.

P507

"INCREASING BONE DENSITY: A LONGITUDINAL STUDY IN A FRACTURE LIAISON SERVICE"

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Objective: To compare bone mineral density (BMD) measurements obtained through Dual-energy X-ray absorptiometry (DXA) shortly after the initiation of pharmacological treatment, and several months after, in a Fracture Liaison Service (FLS) cohort of hip fracture patients. Additionally, to determine the effectiveness of osteoporosis treatment in improving bone density and reducing the risk of further fractures.
Methods: A prospective FLS recruited all patients with hip fractures, without dementia and able to walk post-fracture, since October 2019. Medications were prescribed according to best practices, national recommendations, and patient preferences. DXA was requested at the first appointment and again at the 24-month follow-up. The Shapiro-Wilk test assessed data normality. A paired t-test compared the BMD scores, analyzing t-values and z-values for the L1-L4 vertebrae, femoral neck, Ward's triangle, femoral trochanter, and total BMD to determine significant improvements post-medication. A p-value <0.05 was considered significant.
Results: Out of 159 patients who attended the first appointment, 92 are still in the 24-month treatment and didn't undergo the second DXA; 19 were lost to follow-up; 5 didn't adhere to the treatment and 8 died during follow up. Out of the 35 patients who had two DXA measurements, 83% were female. 83% of the patients were supplemented with a combination of vitamin D, calcium, and Denosumab every 6 months, while the remaining 17% received vitamin D, calcium, and bisphosphonates. The average interval between DXA scans was 25 months and 14 days. Analysis revealed significant improvements in T-scores and Z-scores for the lumbar vertebrae (L1-L4) post-treatment ($p < 0.05$). This also held true for the femoral trochanter Z-score and the total BMD Z-score. No statistically significant differences were observed for the remaining sites studied.
Conclusion: Our study suggests that when patients adhere to treatment, it is effective in achieving higher BMD. Treatment adherence and patients lost to follow up remain a challenge even in an FLS.

P508

IMPROVING BONE HEALTH ASSESSMENTS USING FRAX IN AN ACUTE FRAILTY UNIT

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Objective: Assessment of bone health and fracture risk is a key component of comprehensive geriatric assessment of frail adults. Our project aimed to improve the assessment of fracture risk, using the Fracture Risk Assessment (FRAX) tool, of patients attending our hospital's Acute Frailty Unit (AFU).
Materials and Methods: Admissions to AFU over a two-week period were reviewed retrospectively to determine whether bone health was considered, along with information required for FRAX calculation. Posters were displayed in AFU to encourage consideration of bone health, and clinicians were prompted to ensure FRAX scores were calculated for suitable patients. Additional data were collected over another two-week period to assess for improvement.
Results: A total of 71 patients attended AFU during the initial period, with 48 eligible for bone health assessment who had no previous osteoporosis diagnosis. Of these, three (6.3%) had a FRAX score calculated. Among patients with a history of falls, 8.6% had FRAX calculated. FRAX scores were calculated for the remaining patients, and based on national treatment guidelines, half were deemed eligible for either a bone density scan or initiation of antiresorptive treatment. After the intervention, 43 out of 75 patients were eligible for bone health assessment, and 44.2% had their FRAX scores calculated. This increased to 50% for patients with a history of falls. Seven patients had treatment initiated based on their FRAX scores, compared to just one patient during the initial review period.
Conclusions: The introduction of a poster encouraging bone health assessment in the AFU enhanced the use of the FRAX tool and led to an increased identification of patients suitable for bone density assessment and antiresorptive treatment, compared to previous practice. Identifying patients with osteoporosis risk factors enables early assessment and intervention, reducing the future risk of fragility fractures and associated complications.

P509

CORRELATION AMONG SERUM MARKERS OF MUSCLE QUALITY, BODY COMPOSITION, AND PHYSICAL PERFORMANCE IN A COHORT OF PATIENTS WITH OSTEOPENIA/OSTEOPOROSIS

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Objectives: The study aims to analyze possible correlations between serum markers of muscle quality, body composition, physical performance, muscle strength, and physical activity levels in a cohort of osteopenic/osteoporotic patients.

Material and Methods: Patients diagnosed with osteopenia/osteoporosis underwent an evaluation protocol including anthropometric data (age, sex, body mass index - BMI), Appendicular Skeletal Muscle Mass (ASMM) using bioimpedance analysis (BIA), muscle strength with a Jamar handgrip dynamometer (Hand Grip Strength - HGS), physical performance through the Short Physical Performance Battery (SPPB) and a nutrition screening with Short Mini Nutrition Assessment (SMNA). Physical activity levels were assessed as MET (metabolic equivalent of task) using both a portable actigraph and the International Physical Activity Questionnaire (IPAQ). A blood sample was collected to measure muscle quality markers.

Results: Our analysis included 44 patients (43 F, 1 M; mean age 64.7 ± 7.3 years; BMI 24.8 ± 4.3 kg/m²). The mean serum P3NP concentration was 10.4 ± 2.6 µg/L. The mean ASMM was 17.1 ± 2.3 kg, and the BMI-adjusted ASMM was 0.699 ± 0.0985 kg/(kg/m²), slightly below the literature-reported cutoff for females. Muscle strength and physical performance assessments revealed mean HGS values of 22.2 ± 3.9 kg, weekly MET values of 12,96 ± 2,7, IPAQ scores of 4,57 ± 2,8 MET, and a median total SPPB score of 7 (IQR 4–12).
A weak inverse correlation was observed between serum P3NP levels and BMI-adjusted ASMM (r -.38 $p < 0.008$) as well as between leptin and SMNA (r -0.38 $p < 0.010$). A moderate positive correlation was noted between HGS and BMI-adjusted ASMM (r -0.49 $p < 0.01$) while a weak positive correlation was observed between sclerostin and IPAQ scores (r -0.33 $p < 0.02$)

Conclusions: The study found weak negative correlations between serum P3NP and leptin with muscle mass indicators, suggesting their potential impact on muscle composition in osteopenic/osteoporotic patients. Additionally, a weak positive link between sclerostin and physical activity levels indicates a possible connection between bone metabolism and activity. These findings highlight the complex interplay between biochemical markers, muscle mass, and physical function in this population.

P510

VITAMIN D DEFICIENCY AND FALL RISK DURING EARLY REHABILITATION AFTER TOTAL KNEE ARTHROPLASTY: A CRITICAL WINDOW FOR ACTION

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Introduction: In total knee arthroplasty (TKA) patients, muscle function is crucial for regaining strength, mobility, and balance. Vitamin D is essential for bone health and its role for muscle function and proprioception is receiving increasing attention (1,2). The latter, which is vital for fall prevention, is often impaired post-surgery due to surgical stress, prosthetic implantation, and sarcopenia (3,4). Evaluating vitamin D levels and fall risk during early rehabilitation offers valuable insights into recovery outcomes and safety.

Objective: This study evaluates the prevalence of vitamin D deficiency in TKA patients upon admission to early rehabilitation and examines the relationship between postoperative vitamin D levels, preoperative pharmacological vitamin D supplementation, and fall risk.

Material and Methods: This cross-sectional study included 40 TKA patients (age: 74±6 yrs, BMI: 24±1 kg/m²) admitted to a rehabilitation ward. Vitamin D levels and Conley Scale score, a measure of fall risk, were retrieved from records. Patients were categorized into four groups based on serum vitamin D levels: <10 ng/ml (Group 1), 10–20 ng/ml (Group 2), 20–30 ng/ml (Group 3), and >30 ng/ml (Group 3). Statistical analysis included a two-sample t-test to compare vitamin D levels between groups and Pearson's correlation to evaluate the relationship between supplementation and Conley Scale scores.

Results: Patients who received preoperative vitamin D supplementation, initiated at least one year before surgery, Group 3 and Group 4, had significantly higher serum vitamin D levels and lower fall risk during rehabilitation, with Conley scores respectively of 1.07 (20–30 ng/mL) and 0.50 (>30 ng/mL). Patients with non-history of Vitamin D supplementation exhibited lower levels of vitamin D after TKR along with higher fall risk demonstrated by Conley Scale scores (3.50, Group 1 and 2.73, Group 2). A strong negative correlation (r = -0.837) between vitamin D supplemen-

tation and Conley Scale scores confirmed the effectiveness of supplementation (Figure 1).

Discussion and Conclusion

This study highlights an often overlooked yet crucial phase of early rehabilitation after TKA, a "critical window for action" during which addressing vitamin D deficiency may play a pivotal role in mitigating fall risk and optimizing recovery outcomes. While this is not a clinical trial, the findings provide an important starting point for recognizing the potential impact of routine vitamin D assessment and early intervention.

These preliminary observational data need to be confirmed by clinical trials before their application into definitive recommendations in clinical practice.

Disclosures The authors declare no conflicts of interest.

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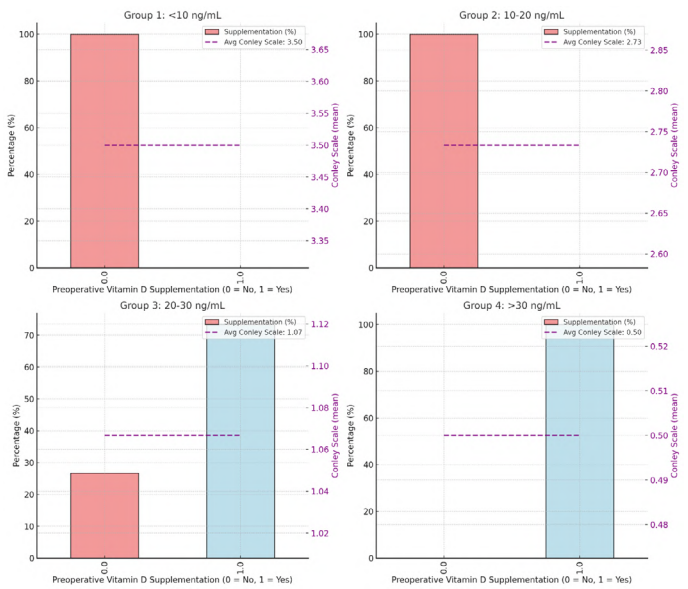

Figure 1: Bar Plot: Represents the percentage of patients with (1) and without (2) preoperative Vitamin D supplementation. Dashed Purple Line: Represents the average Conley Scale score for each group, plotted on a secondary Y-axis for better clarity.

P511

OSTEOPOROSIS AND MULTIPLE VERTEBRAL FRACTURES. A CASE REPORT

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Introduction:

The presence of osteoporotic fractures identifies a subgroup of patients more susceptible to presenting new fractures. Hence the importance of detecting and treating fractured patients.

Case report:

A 65-year-old woman who consulted for severe, persistent and disabling back pain. Two and a half months earlier, without any effort or previous trauma, she presented acute low back pain and was diagnosed with a degenerative process. Low back pain persists and MRI [30/01/2024] (fig.1) identifies fractures D11, D12, L1, performing percutaneous vertebroplasty of L1 with poor clinical response.

The patient had not received any pharmacological treatment for osteoporosis.

In his history, he highlighted: smoking (24 packs/year), low intake of dairy products and little habitual physical activity. No history of nephrolithiasis or RA. No treatment with corticosteroids, antiepileptics, or heparin. Mother with hip fracture at age 45.

Exploration:

Low back pain radiating to the abdomen, accompanied by a significant limitation in range of motion. Dorsal hyperkyphosis with pelvis-rib index < to 2 fingers.

Complementary tests:

DEXA: CL T-score: L1-L4 of - 3.5 SD and CF: - 1.20 SD.

Dorsal and posterior lumbar MRI [04/04/2024]: fractures D7, D8, D9, D1 and D12. L1 foundation material. L2, L3 and L5 fractures, with bone edema pattern (Fig. 2).

Blood tests: ESR: 31 mm/h (<20); CRP: 24 mg/L (0-6). Serum Ca and P and 24-h urine: normal. FA: 449 U/L (88-279), 25(OH) Vit. D3: 7.69 ng/mL. TSH, PTH: normal. Monoclonal IgG Lambda peak. CTX: 1.012 ng/mL (0.104-1.008), P1NP: 103.7 ng/mL (20.3-76.3), NTX: 124.9 nM/nM (26.0-124).

Bone SPECT (Fig. 3): multiple deposits in D7, D8, D11, D12, L1, L2, L5 and 2 grouped deposits, arranged on the 7th and 8th left anterior costal arches in relation to fractures.

Hematology: confirms the existence of IgG Lambda Monoclonal Gammopathy of uncertain significance.

Treatment:

Cholecalciferol 50,000 IU weekly for 8 weeks and then zoledronic acid 5 mg intravenous infusion, cholecalciferol 50,000 IU monthly, 1,500 mg calcium carbonate + 1,000 IU cholecalciferol daily.

In the evolutionary period, there is a significant improvement in clinical manifestations, normalization of RFA and AF, with the val-

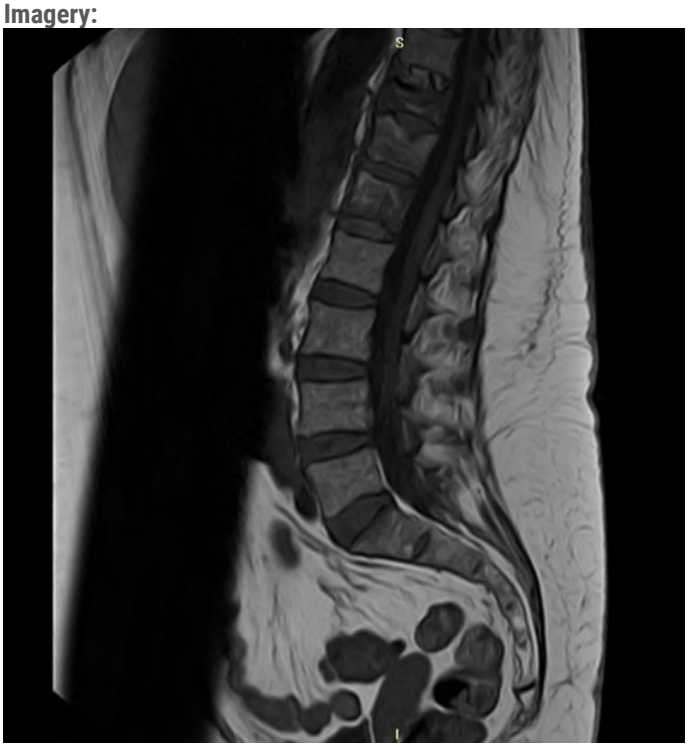
ue being 25(OH)vit. D3 of 29.6 ng/mL.

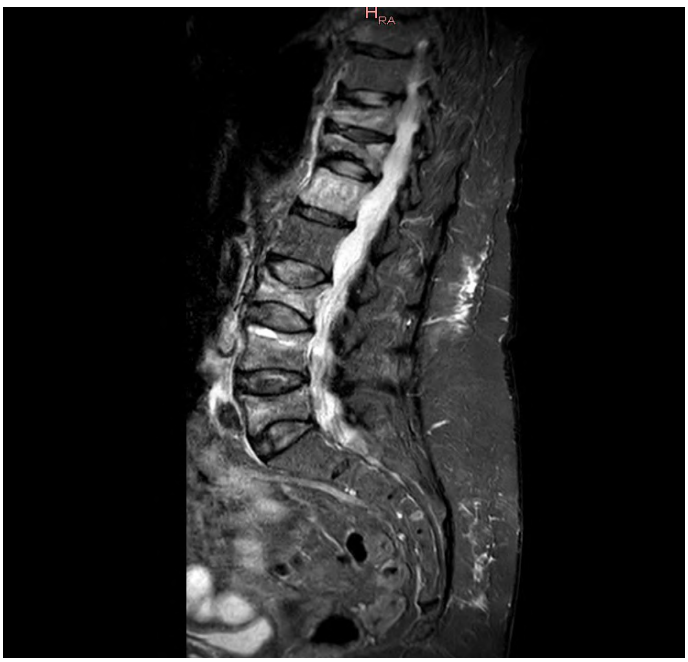
Conclusions:

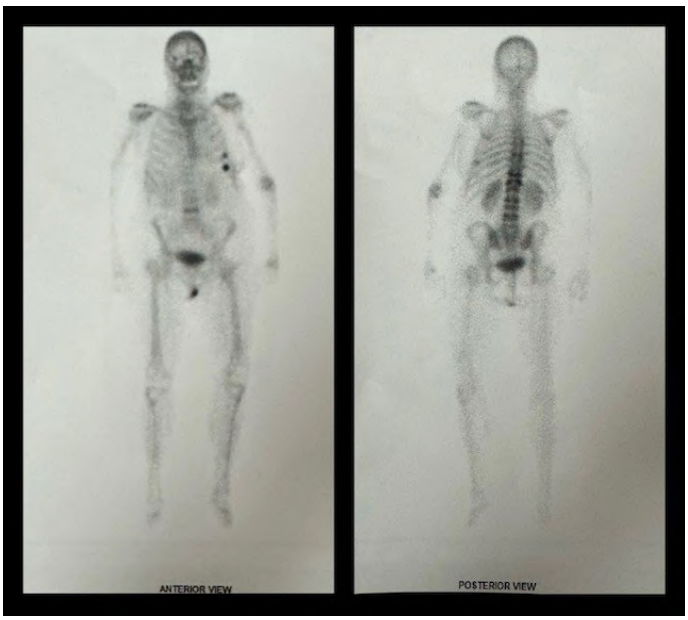
The appearance of new fractures after vertebroplasty is a frequent finding. 12% of patients develop a new vertebral fracture; The highest incidence occurs one month after the procedure, and it is difficult to determine whether they correspond to new secondary fractures, their underlying pathology or are fractures induced by vertebroplasty.

The treatment of vertebral fracture requires a multidisciplinary approach and a detailed study before vertebroplasty.

Imagery:







P512

EROSIVE OSTEOARTHRITIS OF THE HANDS AND POLYOSTOTIC PAGET'S BONE DISEASE. A CASE REPORT

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Objective:

Rare coexistence of this association or pathology.

Introduction:

Erosive osteoarthritis (EOA) should be considered as a variant of primary nodal polyarthrosis. It is a rare, inflammatory, destructive and disabling form. It predominantly affects the DIPs and PIPs joints. Aggressive clinical course, appearance of subchondral erosions, bone and cartilage damage, which can cause ankylosis. Although males may be affected, they do so much less frequently. Joint damage in EOA is not only mediated by interleukins, but also involves other inflammatory molecules such as TNF-α and matrix metalloproteinases. These interactions between cytokines and proteases promote the degradation of articular cartilage and subchondral bone, leading to the destructive characteristics of EOA. Paget's disease of bone (PDB) is the second most common disease of bone metabolism after osteoporosis, with a marked decrease in its incidence in recent decades. It is characterized by the alteration, in one or more bone locations, of the balance between bone formation and resorption. This imbalance results in deformed areas of bone, with a disorganized pattern, increased vascularization and greater fragility despite the apparent increase in bone mineral density.

Clinical Case:

A 63-year-old caucasian man presented for acute low back pain after minimal exertion.

PA:
EOA hand disabling disease, treated with NSAIDs and hydroxychloroquine. No personal or family history of psoriasis.
Exploration: Heberden and Bouchard nodules in bilateral DIPs and PIPs, with functional limitation. Lumbar paravertebral contracture, L4-L5 apophysalgia and limitation to flexion and rotations of the right hip.
Blood tests: ESR: 27 mm/h (<20); CRP: 15 mg/L (0-6); FA: 402 U/L (88-279). FR, anti-CCP and ANA: negative.
Rx: Soft tissue augmentation in DIPs and PIPs bilaterally with subluxations, erosive and osteolytic lesions. Bilateral thumb rhizarthrosis (fig. 1). Lumbar spondyloarthrosis. Involvement of the bone trabeculae and global bone thickening in the iliopubic ramus, ischium, acetabulum and right pubis (fig.2).
Bone scintigraphy with 99 mTc-HDP (fig.: 3): Hyperuptake in MCPs of the first finger, bilateral interphalangeal and carpal, left parietal bone, right scapula, L3 vertebra and right hemipelvis.
CT scan: Bone rarefaction with hypodense areas in the left frontoparietal region. Osteoblastic lesion in the right scapula. L3 osteolysis (fig. 4). Areas of osteolysis alternating with other osteoblastic areas involving the iliac bone, acetabulum, and right ileus and ischiopubic branches.

Conclusions:

The diagnostic challenges associated with the rare coexistence of EOA and PDB, which can have a significant impact on patients' functionality and quality of life, due to the combination of joint damage and structural bone alterations.
PDB should be considered as a new addition to the large family of osteoimmunological disorders. The cytokine profiles observed in this disease are also very similar to those observed in other osteoimmunological disorders, which is why we try to better understand its pathogenesis.

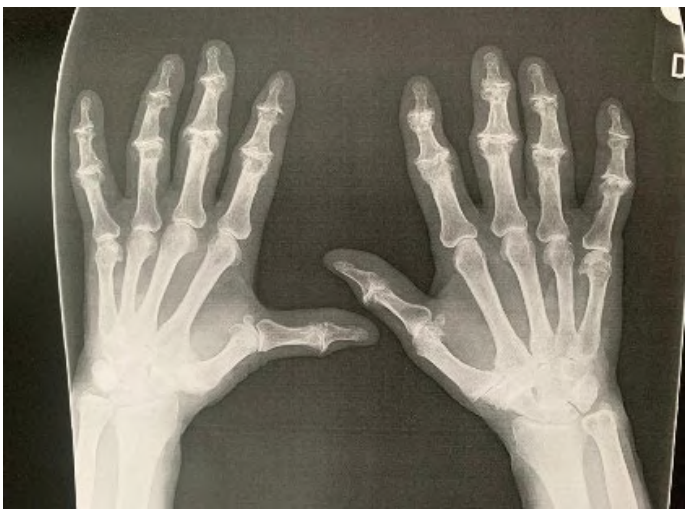

Fig. 1

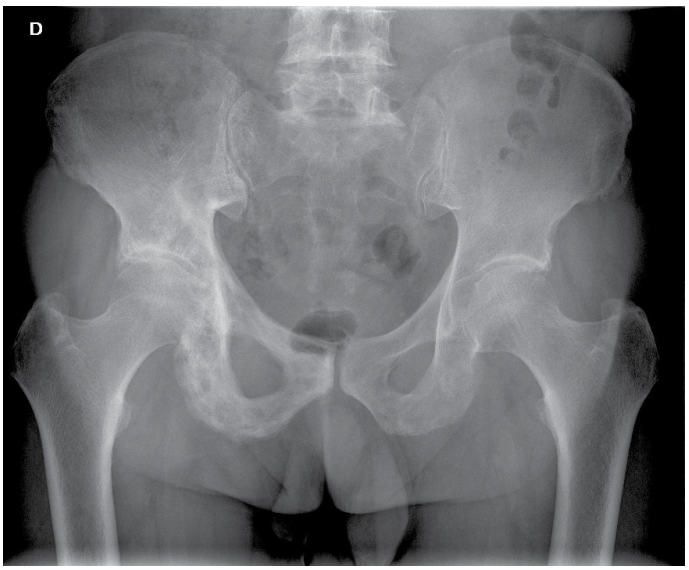

Fig 2.

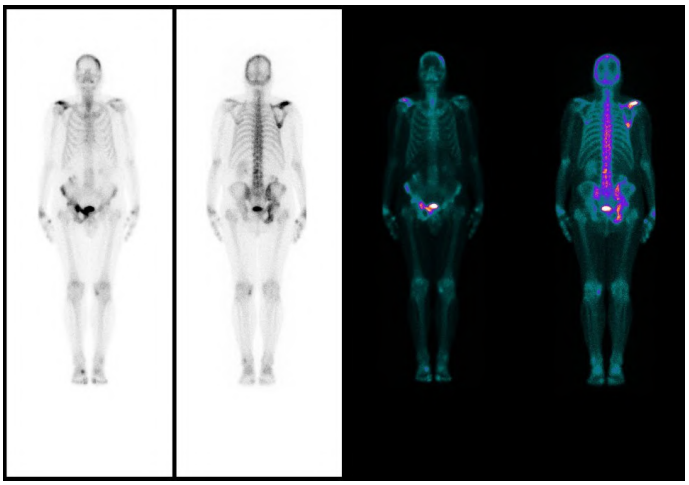

Fig 3.

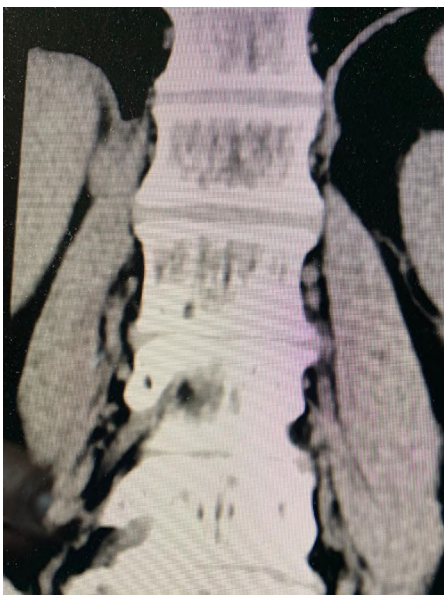

Fig 4.

P513

RELATIONSHIP BETWEEN FOOT BIOMECHANICAL DISORDERS AND KNEE PAIN IN RHEUMATOID ARTHRITIS

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Objective:
Rheumatoid arthritis (RA) is a disease that can lead to biomechanical abnormalities of the foot, requiring precise evaluation. This study aims to explore the associations between foot biomechanical characteristics and the presence of knee pain in patients with RA.
Material and Methods:
This was a single-center, cross-sectional study including patients diagnosed with RA based on the 2010 ACR/EULAR criteria. Sociodemographic data and RA characteristics were collected. All patients underwent a podiatric examination using a podoscanner. The significance level was set at $p < 0.05$.
Results:
Twenty-nine patients, 9 men and 20 women, with a mean age of 59.7 ± 16.1 years [18–84], were included. The mean disease duration was 7.2 ± 7 years [0.5–28]. RA was seropositive in 92% of cases and erosive in 76%. Regarding comorbidities, 14% of patients were smokers, 27% had hypertension, 11% had diabetes, and 11% had dyslipidemia. The mean body mass index (BMI) was 25.7 ± 5.2 kg/m² [16.2–34.5]. Among the patients, 52% had knee pain, 44% had metatarsalgia, and 8% had heel pain. Foot deformities were observed in 22% of patients, with synovitis present in the feet in 24%. The foot arch was abnormal in 66% of patients on the right side and 45% on the left side. Regarding foot types, 86% of patients had a square foot type on the right side and 57% on the left, compared to 14% with an Egyptian foot type on the right and 43% on the left. No statistically significant association was found between the presence of knee pain and the type of foot arch ($p=0.359$ on the right; $p=0.340$ on the left) or foot type ($p=0.353$ on the right; $p=0.340$ on the left). The mean total perimeter of the foot was 33.1 ± 4.1 cm [25.5–44.7] on the right and 37.3 ± 16.1 cm [18.1–109.8] on the left. The mean total volume was 1.1 ± 1 cm³ [0–4.2] on the right and 3 ± 2.2 cm³ [0–6.8] on the left. The presence of knee pain was significantly associated with a higher total foot volume on the left side ($p=0.048$). This association was not observed on the right side ($p=0.336$). The Postural Biomechanical Index (PBI) was abnormal in 48% of cases. No significant association was found between an abnormal PBI and the presence of knee pain ($p=0.191$), heel pain ($p=0.953$), or metatarsalgia ($p=0.165$).
Conclusion:
The results of this study did not reveal a link between knee pain and podiatric abnormalities, particularly the type of foot arch or foot type, in patients with RA.

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LINK BETWEEN BIOMECHANICAL DEFORMATIONS OF THE FOOT AND ANKLE SYNOVITIS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Objective:
Rheumatoid arthritis (RA) is often associated with structural foot deformations, which may influence the development of synovitis. Our objective was to study the impact of biomechanical factors on foot synovitis in patients with RA.
Material and Methods:
This is a monocentric cross-sectional study including patients followed for RA according to the ACR/EULAR 2010 criteria. Socio-demographic data and RA characteristics were collected. All patients underwent podiatric examination using a podoscan. The significance level was set at $p < 0.05$.
Results:
Twenty-nine patients, 9 men and 20 women, with a mean age of 59.7 ± 16.1 years [18-84], were included. The mean duration of RA was 7.2 ± 7 years [0.5-28]. Ninety-two percent of cases were immuno-positive, and 76% were erosive. Regarding comorbidities, 14% of patients were smokers, 27% had hypertension, 11% had diabetes, and 11% had dyslipidemia. The mean body mass index (BMI) was 25.7 ± 5.2 kg/m² [16.2-34.5]. Among the patients, 52% had knee pain, 44% had metatarsalgia, and 8% had heel pain. Foot deformity was noted in 22% of patients. Twenty-four percent of patients had ankle synovitis, 17% of which was bilateral and 7% only on the left. The foot arch was pathological in 66% of patients on the right side and 45% on the left, with a statistically significant association between the presence of synovitis in the right ankle and a pathological arch on the right side ($p = 0.019$). Regarding foot types, 86% of patients had a square foot type on the right side, and 57% on the left, compared to 14% with an Egyptian foot type on the right side and 43% on the left, with a significant association between foot type and the presence of synovitis in the right ankle ($p = 0.01$). Patients with an Egyptian foot type had a significantly lower probability of having synovitis in the right ankle, with an odds ratio of 0.072 (95% CI: [0.009; 0.561]). This association was not found on the left side. The Postural Biomechanical Index (PBI) was pathological in 48% of cases, with no significant association with the presence of ankle synovitis ($p = 0.590$).
Conclusion:
The results of our study highlight the importance of biomechanical foot assessment in the management of patients with RA. The majority of significant associations found in this study were on the right side, emphasizing the importance of considering patients' dominant side when analyzing their complaints and podiatric disorders.

P515

PLACE OF Z-SCORE IN THE DETECTION OF CHEMOTHERAPY-RELATED BONE LOSS IN ALGERIAN YOUNG WOMEN WITH BREAST CANCER

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Background

Breast cancer is the most prevalent cancer type in Algeria, with over 14,000 new cases diagnosed annually, a significant proportion of which occur in women under 40. Due to its aggressive nature, chemotherapy is commonly used as treatment, but it is associated with both immediate and long-term toxicities that can negatively impact the quality of life of cancer survivors. One of the long-term side effects of chemotherapy, particularly in premenopausal women, is hormonal disruption, leading to ovarian failure, chemotherapy-induced amenorrhea (CRA), and early menopause, all of which may contribute to bone loss. The aim of this study was to assess bone mineral density (BMD) and identify potential factors associated with bone loss in young premenopausal patients following adjuvant chemotherapy.

Methods

We included premenopausal Algerian women under 45 years old who had undergone adjuvant chemotherapy. At the time of enrollment, demographic information, cancer characteristics, and menstrual history were collected. BMD was measured at trabecular and cortical sites using dual-energy X-ray absorptiometry (DXA). Factors contributing to reduced BMD and an increased risk of fractures were analyzed.

Results

A total of 94 patients were evaluated. The median age at breast cancer diagnosis was 39 years, while the median age at the time of study entry was 42 years. The median BMDs were 0.96 g/cm² for the femoral neck (FN) and 1.01 g/cm² for the lumbar spine (LS). Of the patients, 37.2% had abnormal Z-scores (≤−2) with a specificity of 84%, and 41.3% had osteopenia or osteoporosis in either the FN or LS. Multivariate analysis identified several factors correlated with bone loss (low BMD), including low vitamin D levels (OR = 2.632 [1.124–4.527]), low BMI (OR = 2.56 [1.599–2.907]), a longer time since the last adjuvant treatment (OR for LS = 2.781 [1.102–4.631]), use of LH-RH analogues(OR [95% CI] = 2.531 [1.691–4.131]),, and the use of adjuvant tamoxifen (OR = 1.752 [1.243–3.841]).

Conclusions

This study emphasizes that bone loss is a prevalent issue among early breast cancer survivors who have undergone chemotherapy. Approximately 37.2 of these survivors experience bone loss. Identifying and addressing factors associated with bone loss is essential to prevent fractures and improve long-term health outcomes for these patients.

P516

MADELUNG'S DEFORMITY AND DYSCHONDROSTEOSIS: A CASE REPORT

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Objective: Madelung's deformity (MD) is a rare congenital anomaly of the wrist and constitutes about 1.7% of all developmental hand deformities [1]. It is caused by premature closure of the medial and volar aspect of the distal radial physis [2]. MD occurs predominantly in adolescent females and is often associated with Leri Weill dyschondrosteosis [3]. The objective of this case report was to describe the clinical presentation and radiographic findings of MD.

Methods: We present a case report of a girl with Leri Weill dyschondrosteosis.

Results: A 17-year-old girl, with an unremarkable medical history, was admitted to our department of rheumatology because of gross disfigurement at the wrists with pain and difficulty executing daily activities, which have progressed gradually over the last four years. There was no trauma or fall. Physical examination revealed a girl with short stature and dinner fork deformity of the wrists, there was a spontaneous palmar subluxation of the wrist with the dorsal prominence of the ulna head (Figure 1). The patient also has shortened forearms and a bilateral decreased range of motion in pronation, supination, and wrist extension. There was no evidence of deformity of any other member of the family. Radiographs of both wrists showed a shortening and curvature of the radius, a widened distal radioulnar joint, and a triangular arrangement of the carpal bones (Figure 2). The clinical presentation and X-ray findings were typical of Madelung's deformity associated with Léri-Weill dyschondrosteosis. Conservative treatment was indicated because the patient refused to accept surgical intervention.

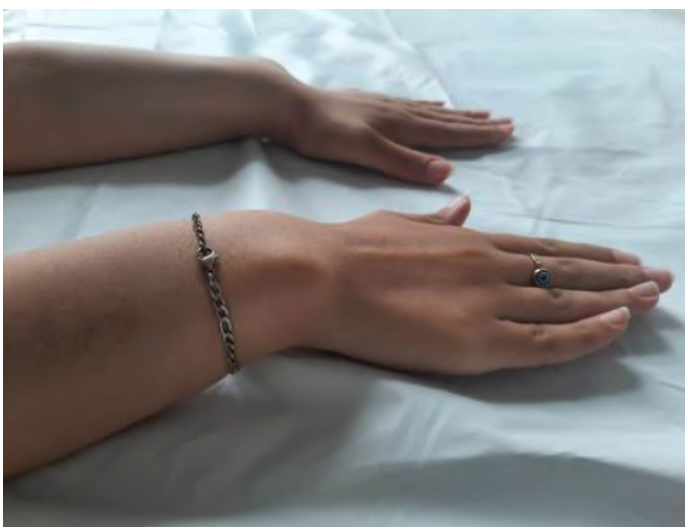

Figure 1

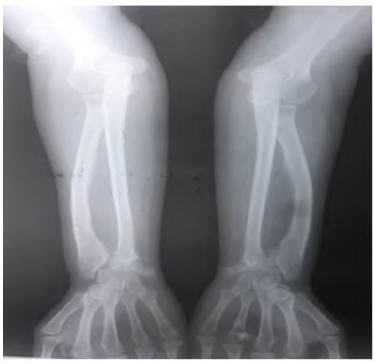

Figure 2

Conclusion:

MD of the wrists is rarely encountered in clinical practice but has definite radiological appearances. MD can occur in isolation or in association with other diseases. In our case, the patient also had short stature and mesomelia consistent with Leri-Weill syndrome. Conservative treatment is important in primary management and surgical options depend on the symptoms and patient's preferences.

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P517

THE FREQUENCY OF INFECTIONS IN JUVENILE IDIOPATHIC ARTHRITIS PATIENTS TREATED WITH BIOLOGIC THERAPY

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Objective:

Biologic agents are widely used in juvenile idiopathic arthritis (JIA) therapy. However, in spite of their high benefits, they are associated with a risk of infections. The study objective was to describe the infectious complications occurring in JIA patients under biologic therapy.

Methods:

We performed a single-center, retrospective study including patients diagnosed with JIA according to ILAR classification criteria and treated with biologics from January 2019 to December 2024. All infectious events were identified and the date, the site, the type of pathogen, the severity, and the treatment were assessed for each infectious event.

Results:

A total of 42 patients were included, 16 males (38.1%) and 26 females (61.9%). The mean age at the diagnosis was 8.3±4.2 years and the mean age at symptom onset was 7.5±4.2 years. The predominant subtypes of JIA were the systemic form (n: 12, 28.6%) followed by the seronegative polyarticular form (n:11, 26.2%), the oligoarticular form (n: 6, 14.3%), the seropositive polyarticular form (n: 5, 11.9%), enthesitis-related arthritis (n:4, 9.5%) and juvenile psoriatic arthritis (n: 3, 7.1%). One child had undifferentiated arthritis. Patients received etanercept in 19 cases (32.8%), adalimumab in 11 (43.2%), tocilizumab in 8 (19%), and anakinra in 4 (9.5%). The mean age at first use of a biologic was 10.6±3.8 years and the mean time between diagnosis of JIA and the first use of a biologic was 2.3±2.2 years. Biological agents were used as monotherapy in 9 patients (21.4%), in combination with methotrexate in 22 (52.4%), in combination with corticosteroids in 21 (50%), and in combination with NSAIDs in 12 (28.6%). During the study period, 18 patients (42.9%) developed an infection, of whom 9 (50%) had more than one infection. The mean time between the start of a biologic and the occurrence of the infectious event was 8.1±6.8 months and the most common sites were: ENT system (72.2%), urinary and genital tracts (38.9%), respiratory tract (27.8%), the skin (23.5%) and gastrointestinal system (11.1%). The infection agent was identified in 12 cases (4 Escherichia coli, 2 Staphylococcus aureus, 2 SARS-CoV, 1 Klebsiella pneumoniae, 1 varicella zoster, 1 herpes zoster and 1 candida albicans). Infections occurred in 8 patients with systemic arthritis (44.4%), 6 polyarticular arthritis (33.3%), 2 juvenile psoriatic arthritis (11.1%), one enthesitis-related arthritis, and one undifferentiated arthritis (5.6%). One patient required hospitalization, he was treated with etanercept and methotrexate for seronegative polyarticular arthritis. The risk of infectious events with IL-6 inhibitors was significantly higher compared to TNF inhibitors and IL-1 inhibitors (p=0.02). There was no statistically significant relationship between the risk of infection development and subtypes of JIA.

Conclusion:

Our study showed a high rate of infectious events in JIA patients under biologic therapy, affecting mainly the ENT system. They are more frequent in patients treated with IL-6 inhibitors.

P519

EFFECTIVENESS OF ROMOSOZUMAB ON BONE MINERAL DENSITY SURROGATE THRESHOLD EFFECT: RESULTS FROM THE ROMOSOZUMAB EARLY EXPERIENCE IN FEMALE PATIENTS WITH SEVERE OSTEOPOROSIS (ROMEO STUDY)

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Background

Romosozumab (ROMO), a sclerostin inhibitor, has been approved in Italy for treating postmenopausal osteoporosis (OP) in women at high fracture risk.

Objectives

To evaluate the effectiveness of ROMO in a cohort of Italian postmenopausal women at high fracture risk.

Methods

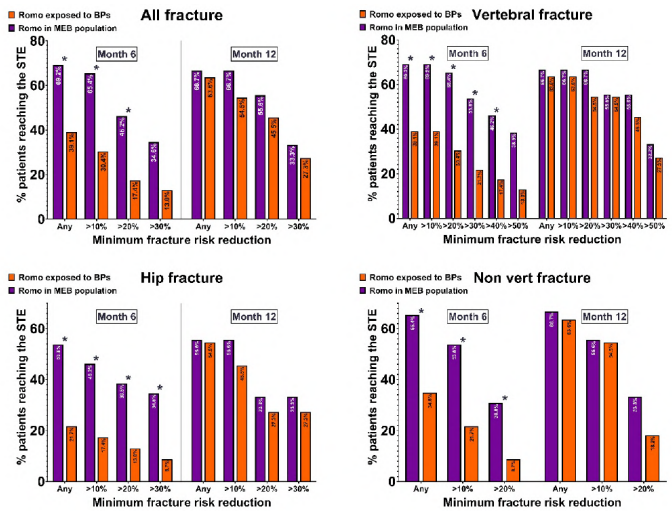
We retrospectively analyzed prospectively collected data from postmenopausal women with severe OP treated with ROMO at the Verona center. Bone mineral density (BMD) was assessed at baseline, month 6, and month 12. Bone turnover markers (BTMs) and calcium-phosphate metabolism were measured at baseline and months 3, 6, and 12. The surrogate threshold effect (STE) for BMD, defined as the change needed to predict fracture risk reduction with 95% confidence, was evaluated based on the FNIH-ASBMR SABRE Project criteria.

Results

The study included 133 postmenopausal women (mean age 72.5 ± 9.5 years). Seventy-nine patients completed 6 months of follow-up, and 39 completed 12 months. A subgroup of 91 patients had minimal prior bisphosphonate exposure (MEB). Significant BMD increases were observed at all sites at 6 and 12 months, particularly in the MEB group: femoral neck (+3.9% and +6.5%), total hip (+3.4% and +3.7%), and lumbar spine (+7.5% and +10.9%). Over 50% of patients reached the STE for fracture risk reduction by 6 months, with higher proportions in the MEB group. Among patients with baseline lumbar spine T-scores ≤-2.5, 18.2% and 32.0% reached a T-score >-2.5 at months 6 and 12, respectively. P1NP levels increased significantly at months 3 (+76.2%) and 6 (+34.6%), while CTX levels decreased (-2.6% and -26.6%). BTMs returned to normal ranges by month 12.

Conclusion

In this real-world cohort of Italian postmenopausal women at high fracture risk, over half achieved the STE for minimal fracture risk reduction, particularly those with minimal bisphosphonate exposure. Additionally, one-third reached osteopenic BMD levels after ROMO treatment.



P520

INCREASE IN SERUM DKK1 LEVELS ATTENUATES THE ANABOLIC RESPONSE TO ROMOSOZUMAB IN POSTMENOPAUSAL OSTEOPOROSIS

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Background

Romosozumab exhibits strong anabolic effects in treating osteoporosis in the first 6 months of treatment, yet its efficacy diminishes beyond 6 months as bone formation markers decline. We hypothesized that increased levels of Dickkopf-1 (Dkk1), a Wnt pathway inhibitor, might contribute to this attenuation by suppressing osteoblast activity.

Methods

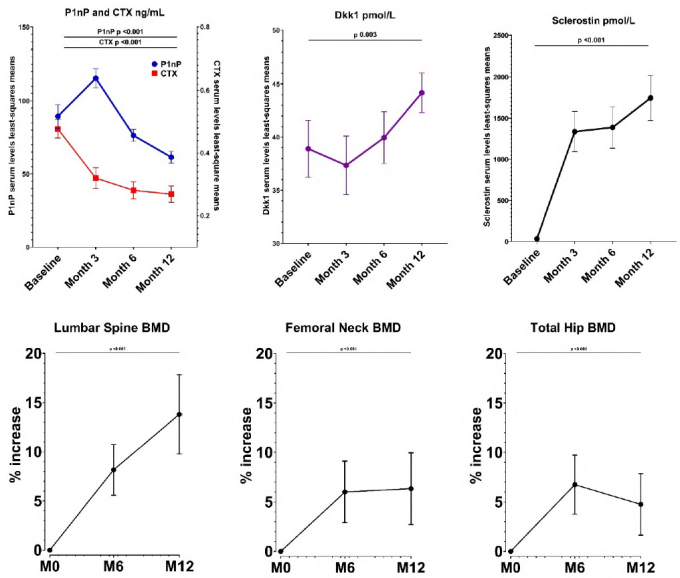
We did a 12-month prospective observational study on postmenopausal women with osteoporosis naive to anti-osteoporosis treatment and treated with romosozumab. Serum Dkk1, Procollagen Type I N-Terminal Propeptide (P1NP), C-terminal telopeptide of type I collagen (CTX), and sclerostin were measured at baseline (M0) and at 3 (M3), 6 (M6), and 12 months (M12). Bone mineral density (BMD) was assessed at M0, M6, and M12. Linear mixed-effects models were used to analyze associations between Dkk1 and P1NP.

Results

59 women were included. Dkk1 increased significantly from 38.9 pmol/L at baseline to 44.2 pmol/L at M12 ($p = 0.003$). P1NP increased significantly from M0 to M3 (89.4 pg/mL to 115.4 pg/mL, $p = 0.004$) before declining to 61.5 pg/mL at M12 ($p < 0.001$). CTX levels significantly decreased from 0.477 pg/mL at baseline to 0.269 pg/mL at M12 ($p < 0.001$). Sclerostin levels increased steeply from 36.3 pmol/L at baseline to over 1500 pmol/L at all time points ($p < 0.001$). BMD significantly improved across all skeletal sites. A significant association was found between Dkk1 increase and P1NP decrease between M3 and M12 (estimate -0.909, $p = 0.032$), suggesting a compensatory mechanism influencing romosozumab's effects.

Conclusions

Romosozumab improves BMD in postmenopausal osteoporosis but is associated with increased Dkk1, which may reduce its anabolic effects over time. These findings underscore the potential of dual inhibitors targeting sclerostin and Dkk1 to mitigate this limitation and enhance therapeutic outcomes.



P521

FIRST MULTIDISCIPLINARY CLINICAL PRACTICE GUIDELINES FOR OSTEOPOROSIS IN COLOMBIA: EVIDENCE-BASED AND CONTEXT-SPECIFIC RECOMMENDATIONS

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Objective: To develop Colombia's first evidence-based clinical practice guidelines (CPGs) for osteoporosis diagnosis and treatment, reflecting the country's healthcare context and resources. Material and Methods: A multidisciplinary team of endocrinologists, rheumatologists, geriatricians, family physicians, orthopedists, physiatrists, sports medicine specialists, and patient representatives developed the guidelines using GRADE methodology. Systematic reviews of the literature were conducted, and evidence was critically appraised to formulate 32 recommendations and 14 good practice points. Results: The guidelines promote early detection in primary care settings through country-specific FRAX® thresholds for fracture risk assessment in adults aged ≥50 years with risk factors. When DXA is unavailable, FRAX® intervention thresholds guide treatment decisions. Radiofrequency Echographic Multi Spectrometry (REMS), now available in Colombia, serves as an alternative diagnostic tool. Comprehensive evaluation includes TBS and vertebral fracture assessment in high-risk cases. Management recommendations embrace span lifestyle modifications, supplementation, and prescribed exercise programs. Pharmacological interventions with bisphosphonates, denosumab, or bone-forming agents are tailored to fracture risk profiles. The guidelines emphasize sequential therapy planning and systematic monitoring through DXA, imaging, and adherence assessment. Implementation through Fracture Liaison Services and orthogeriatric care models aims to enhance outcomes. Conclusions: These inaugural Colombian guidelines provide an evidence-based, nationally adapted framework for osteoporosis management. The recommendations reflect local healthcare resources while promoting standardized, high-quality care through coordinated multidisciplinary services. Disclosures: Funded by the Colombian Association of Osteoporosis and Mineral Metabolism (ACOMM). No conflicts of interest reported.

P522

PREVALENCE AND RISK FACTORS FOR MUSCULOSKELETAL DISORDERS AMONG POSTAL SORTING CENTER EMPLOYEES

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Introduction: Musculoskeletal disorders (MSDs) represent a major occupational health issue due to their high prevalence and considerable socio-economic costs. In the Tunisian context, where epidemiological data on MSDs in this sector are limited, we deemed it interesting to conduct a descriptive, cross-sectional survey among postal sorting center employees.Objective: We aimed to assess the prevalence of MSDs among workers at a Tunisian postal sorting center, and to identify the associated risk factors.Methods: A cross-sectional study was carried out on 50 employees of a postal sorting center in Tunisia, representing a participation rate of 32.8%. Data were collected using a questionnaire inspired by the Nordic questionnaire and the INRS (National Institute for Research and Safety) questionnaire for MSD screening.Results: The study conducted among 50 postal workers out of a total of 152 assigned to the Postal Sorting Center revealed a high prevalence of MSDs, affecting 80% of participants over the past 12 months. The median age of participants was 51 years [30-61]. The M/F sex ratio was 6.14, showing a clear male predominance. The median length of service was 22 years, with sorting agents being the most prevalent category (52%). Sixty-six percent of participants performed repetitive tasks, 50% regularly carried heavy loads (>30 Kg) and 38% estimated working at a

"very fast" pace. One third of postal workers reported significant stress over the past 12 months, and 24% had frequent episodes of exhaustion. Almost 30% suffered from recurrent anxiety. As for musculoskeletal disorders (MSDs), 80% of postal workers had experienced them over the past year. The most frequently affected anatomical regions were the lumbar region (56%), the cervical region (44%) and the femoro-tibial joint (40%). Upper limbs were also affected, with manifestations in wrists and hands (28%) and elbows and forearms (24%).Among them, 52% had consulted a physician for these symptoms, of whom 38% underwent medical treatment and 14% were granted medical leave.Conclusion: This study reveals an alarming prevalence of musculoskeletal disorders (MSDs) among Tunisian postal workers, underlying the urgent need for integrated prevention programs that include ergonomic, organizational and psychosocial interventions to reduce the incidence of MSDs in this sector.

P523

STRESS FRACTURE IN MALE ROYAL MARINES RECRUITS: WORKING TOWARD IDENTIFICATION OF THOSE AT HIGHEST RISK OF INJURY

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Objective

Stress fractures (SF) are common among individuals engaging in intense physical activity, such as military personnel. Previous research identifies female sex as a risk factor for SFs in military settings, but SF is a significant injury burden in male recruits as well. We aimed to report the prevalence of SFs and to identify characteristics associated with fracture in male Royal Marines (RM) recruits.

Material and Methods

We studied 1,815 male RM recruits (aged 16-33 years) who started a 32-week training programme at the Commando Training Centre Royal Marines, UK, between November 2017 and March 2020. Baseline (week-1) exposures included age, weight, body mass index (BMI), waist circumference, waist-to-height ratio, smoking status, estimated maximum oxygen consumption (VO2max), and maximum counts of sit-ups, press-ups and pull-ups. Incident SFs during the training programme were determined through radiography or MRI imaging. Associations between baseline exposures and SF were examined using univariate logistic regression.

Results

The median (lower quartile, upper quartile) age at entering training was 21 (19.2, 23.3) years. Cardiorespiratory fitness levels at the start of training were high, with median VO□max of 52.2 (51.1, 54.6) mL/kg/min. Mean (SD) BMI was 24.5 (2.1) kg/m2, and 10.4% were current smokers. Most recruits (85.6%) had healthy central adiposity (waist-to-height ratio: 0.4–0.49), with none classified as high (≥0.6). 102 (5.6%) recruits sustained at least one SF, with the highest rates in those aged 16-18 years at training entry (7.2%). In univariate analyses, the highest quintiles of BMI (odds ratio 0.16, 95% CI 0.06-0.42, p<0.001), weight (0.50, 0.26-0.95, p=0.036), waist circumference (0.40, 0.19-0.83, p=0.014), and waist-to-height ratio (0.37, 0.18-0.78, p=0.009) demonstrated significantly lower odds of SF compared to respective lowest quintiles. No other associations were observed between the other exposures and incident stress fracture.

Conclusions

Stress fractures were common in Royal Marines recruits, especially those who were less skeletally mature. In this population where central adiposity was very uncommon, higher BMI appeared protective against SF risk and we hypothesise that greater BMI is likely related to reduced SF risk via greater muscle mass rather than greater adiposity. Further validation in other cohorts is planned.

P524

RISK FACTORS FOR FRACTURES IN TYPE 2 DIABETES: A RETROSPECTIVE STUDY IN AN OUTPATIENT COHORT

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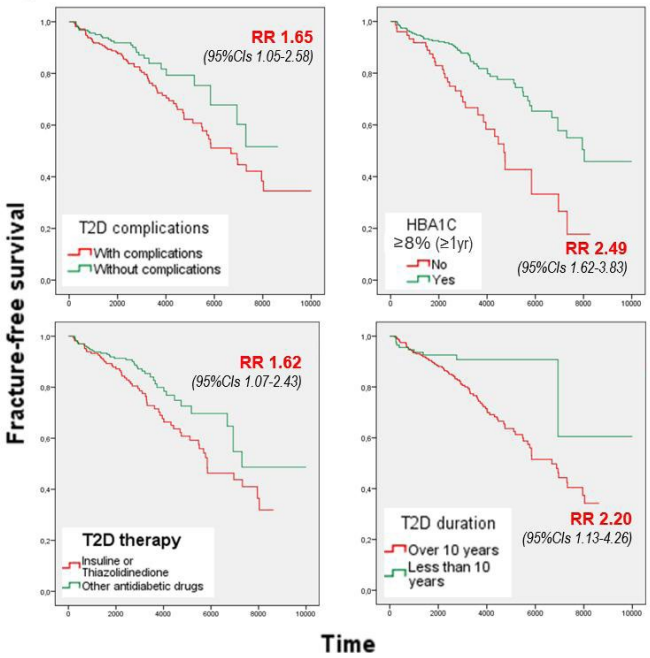
Background: Patients with type 2 diabetes (TD2) have an increased risk of fracture and common diagnostic strategies such as bone densitometry (DXA) and FRAX algorithm underestimate this risk. Recent position statements proposed the use of specific algorithms to improve fracture prediction in T2D, based on the integration of risk factors (RFs), the presence of prevalent fractures, and, where necessary, DXA and FRAX. Importantly, beside the classical RFs for fractures (i.e. age, sex, prevalent fractures), T2D duration ≥ 10 yrs, the presence of ≥ chronic T2D complications, the use of insulin or TZDs treatment, and a poor glucose control (i.e. HbA1c ≥8% for at least 1 yr) have been included in those algorithms. However, their implication in fracture risk remains to be universally confirmed.

Objectives and Methods: In this study, we assessed the predictive role of these T2D-related RFs on fracture incidence in 402 T2D patients attending the outpatient service (mean age 72±9 yrs, range 45-90) followed for 9 yrs. Subjects were followed from the baseline visit to the date of fracture event; subjects without fracture were censored at the end of follow-up.

Results: The incidence of fractures progressively increased in relation to the number of T2D-RF(no RF: 8%, 1 RF: 16%, 2RF:25%; 3RF:38%; 4RF:46%; p<0.0001) so that patients with all the 4 T2D-RF had an hazard ratio (HR) of 4.04 (95% CI, 1.3–10.68; p < .005) compared with the reference group of patients without T2D-RF. As shown in Figure 1, each of the selected T2D-RF separately contributed to fracture incidence with HRs of, respectively, 1.65 (95% CI, 1.05–2.58; p < .05), 2.49 (95% CI, 1.62–3.83; p < .001), 1.62 (95% CI, 1.07–2.43; p < .05), and 2.20 (95% CI, 1.13–4.26; p < .05) for T2D complications, uncontrolled diabetes, insulin or

TZD treatment and T2D duration ≥ 10 yrs, as compared with the reference group (no T2D-RF).
Conclusions: the use of the above-mentioned T2D-RF should be mandatory in fracture risk stratification of patients with T2D.

Figure 1



P526

ADHERENCE TO GUIDELINES IN THE PRESCRIPTION OF ANTI-RESORPTIVE DRUGS FOR BREAST AND PROSTATE CANCER: AN ITALIAN EXPERIENCE

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Introduction:
The prescribing of drugs for osteoporosis is regulated in Italy by Note 79. This Note outlines the use of the following drugs for the primary prevention of osteoporosis in women with breast cancer or men with prostate cancer treated with adjuvant hormonal blockade.
Methods:
From June 2023 to September 2024, patients belonging to the our clinics, with any access diagnosis and a history of breast or prostate cancer within the last 10 years, aged between 50 and 75, were evaluated.
Results:
150 patients (120 women and 30 men) met the inclusion criteria. Men had a mean age of 68, with an average disease duration of 6.8 years. The mean age was 64,2 years old with an average disease duration of 5.3 years. There was also a group of 25 people that went to the clinic for lymphatic drainage where they underwent treatment for lymphedema of the upper right and/or left limb 2 to 3 times per year. Out of them, 75% had undergone at least 1 densitometry in the past 5 years and, among them, at least half, especially the older ones, regularly had densitometry performed every 18 months. 65% had taken a dosage of Vit.D in the last year and were regularly treated with Cholecalciferol. In total, the women undergoing preventive treatment were 25, with a notable prevalence of the use of classic biphosphonates and a clear minority of Zoledronato (2) and Denosumab (4). Conclusion: Of the patients that potentially could have and should have had access to the treatment planned in Note 79, just a small minority, generally female, received the outlined treatment. The risk of facing bone complications increases with the patient's age at disease onset and the time passed before the beginning of the treatment. Discussion: The risks in patients that are already in difficult conditions and an increase of the costs for the problems linked to the risk of fracture from osteoporosis, but also pain associated with the progressive impoverishment of the bone structure.

P527

IS MYOSTATIN LEVEL A DETERMINANT OF FRACTURE RISK IN OSTEOSARCOPENIC PATIENTS?

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Introduction and Aim: Myostatin is a molecule that has been linked to osteoporosis and sarcopenia. However, no studies investigating the relationship between myostatin and osteosarcopenia have been found in the literature. In this study, we aimed to determine the myostatin levels in osteosarcopenic patients and evaluate the relationship between myostatin levels and fracture risk assessed by FRAX.
Materials and Methods: Patients diagnosed with osteosarcopenia who admitted between October 2023 and June 2024 were included in our study. The patients were divided into two groups such as osteosarcopenic and non-osteosarcopenic individuals. Demographic data, laboratory parameters, bone mineral density (BMD) measured by DXA (Dual-energy X-ray absorptiometry), FRAX score, skeletal muscle mass index (SMI) determined by bioimpedance analysis (BIA), and myostatin levels in serum samples were examined. A myostatin cutoff value was determined. The relationship between FRAX score and myostatin levels was investigated between the two groups.
Results: Significant differences were found in terms of menopause age, education level, and monthly income. Myostatin levels were significantly higher in the osteosarcopenia group (p=0.037). Additionally, in the patient group, FRAX, SARC-F (Strength, Assistance with walking, Rise from a chair, Climb stairs, and Falls) measurements, walking speed, and sit-to-stand times were found to be significantly higher compared to the control group (p<0.001). The L1-L4 vertebra, femoral neck T-score, and handgrip strength were significantly lower in the patient group compared to the control group (p<0.001). A significant (AUC=0.636) effectiveness of the 16.72 ng/mL myostatin cutoff value was observed in distinguish-

ing the case and control groups. At this cutoff value, myostatin showed 70.7% sensitivity and 57.5% specificity. A significant correlation was found between myostatin levels and the FRAX hip and major osteoporotic fracture risk (r=0.528, p<0.001; r=0.631, p<0.001, respectively). A significant difference was found between FRAX-calculated hip fracture (HF) risk and myostatin levels in the univariate regression analysis (p=0.005).
Conclusion: Although the role of myostatin levels in the pathogenesis of osteosarcopenia has not been fully clarified, myostatin levels could be an important marker in terms of predicting diagnosis and related complications in predicting osteosarcopenia diagnosis and related complications.

P528

CHALLENGING KNEE OSTEOARTHRITIS: EFFICACY AND TOLERABILITY OF AN INNOVATIVE MEDICAL DEVICE CONTAINING A COMBINATION OF HYALURONIC ACID AND POLYPEPTIDES AS TOPICAL THERAPY

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Objective.
A new topical hydrogel (CR500®) available as a monodose vial, containing hyaluronic acid and two polypeptides, derived respectively from Fibroblast Growth Factor 9 (FGF-9) and Connective Tissue Growth Factor (CTGF), has been developed to counteract cartilage degeneration and improve symptoms in patients with non-severe knee osteoarthritis (OA). The content of the vial must be squeezed into the centre of a surgical patch and applied to the target area. The efficacy of CR500® was evaluated in a single-arm, post-market confirmatory interventional clinical trial.
Material and Methods.
A total of 38 patients with unilateral mild-moderate knee OA were enrolled. Each patient underwent a screening visit (V-1), a baseline visit (V1) and 3 follow-up visits (V2-V4) on a weekly interval, from week 2 to week 4. The primary outcome was the evaluation of the Lequesne Knee Index (LKI) after the topical knee application of CR500®, twice a week for 4 weeks. Knee injury and Osteoarthritis Outcome Score (KOOS), synovial fluid (SF) collection for cartilage-related markers quantification (C2C, CTXII, CPII, TNFα and HA) and analysis of macrophage polarization genes expression (*CD11c*/*CD206*) were also evaluated.
Results.
35 patients were included in the final analysis. The LKI total score showed a statistically significant reduction from baseline/V1 to end-of study visit/V4 by 28% (p<0.001).
The KOOS score also confirmed a significant improvement of patient condition already at V2 in comparison with baseline/V1 for all subscales (except for KOOS sport subscale which significantly improved from V3), suggesting a quick efficacy of the treatment.
A thorough SF analysis was limited by insufficient joint liquid at protocol's end. However, V1 data and KOOS pain scores suggest less pain correlates with reduced cartilage remodelling, despite a pro-inflammatory infiltrate.
Conclusions.
The treatment with CR500® showed a marked and statistically significant improvement in knee pain and function, suggesting that the device has the potential to quickly attenuate the symptomatology related to the osteoarthritic processes starting from the 2nd week of treatment (4-6 applications). Hence, CR500® resulted to be effective, safe, convenient and well tolerated.
Disclosures.
Dr. Luca Forte is an employee of Contrad Swiss SA. The other authors do not have competing interest.

P529

ADVANCING TRABECULAR BONE SCORE (TBS): CLINICAL PERFORMANCE OF TBS VERSION 4.0 WITH DIRECT CORRECTION FOR SOFT TISSUE THICKNESS - THE OSTEOLAUS STUDY

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Objectives: This study aimed to compare trabecular bone score (TBS) version 4.0, which uses direct tissue thickness correction via DXA measurements, with TBS version 3, which adjusts for soft tissues using body mass index (BMI). The objective was to assess the performance of TBS v4.0 compared to v3, for bone health evaluation and fracture risk assessment across diverse body compositions.
Methods: Data from the OsteoLaus cohort were analyzed. Associations between TBS, BMI, DXA-measured tissue thickness, visceral fat (VFAT), and android fat were examined using regression and correlation analyses. Machine learning, including Random Forest (RF) and SHapley Additive exPlanations (SHAP), explored TBS changes between versions. Five-year fracture risk was assessed using FRAX adjustment, and logistic regression.
Results: TBS v3 correlated with BMI (r = 0.110, p <0 .001), VFAT mass (r = -0.162, p <0 .001) and soft tissue thickness (r=-0.165, p<0.001). TBS v4.0 demonstrated weaker correlations with BMI (r=-0.057, p>0.999), VFAT Mass (r=-0.067, p>0.779) and soft tissue thickness (r=-0.114, p=0.019). Differences between TBS versions were investigated with SHapley Additive exPlanations (SHAP) and explained by BMI, tissue thickness, VFAT, and gynoid fat. Logistic regression and Delong's test revealed no significant differences in fracture prediction between the two TBS versions (p = 0.564). FRAX adjustments were highly consistent between versions (r = 0.994, p < 0.001), with no evidence of calibration bias (p = 0.241).
Conclusion: TBS v4.0 enhances the adjustment for regional soft tissue effects and maintains comparable vertebral fracture risk

prediction to TBS v3. Explainable AI provided insights into the contributions of BMI, tissue thickness, visceral fat, and gynoid fat to the observed changes between TBS versions. Incorporating direct tissue thickness adjustment improves TBS applicability across diverse body sizes and compositions.

Disclosures

Enisa Shevroja, Elena Gonzalez-Rodriguez, and Olivier Lamy declare that they have no conflicts of interest. Guillaume Gatineau and Karen Hind are employees of medimaps group SA, developers of TBS iNsight™ software. Didier Hans is co-owner of the TBS patent, has corresponding shares and is CEO at medimaps group.

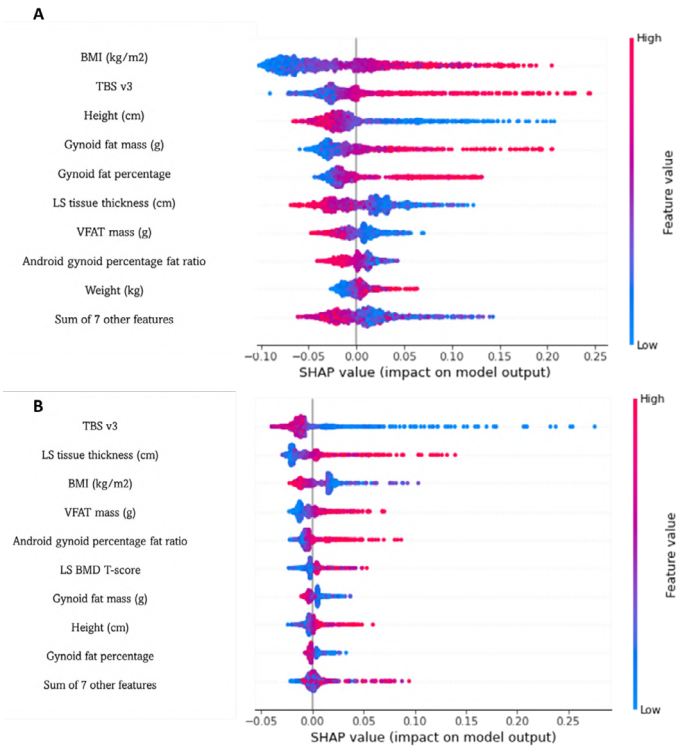

Figure 1: SHAP values for the TBS v4.0 change prediction compared to TBS v3.0

A: SHAP values for the iDXA TBS v4.0 low change prediction. **B**: SHAP values for the iDXA TBS v4.0 high change prediction.

P530

SURGICAL TREATMENT OF VERTEBRAL FRACTURES THROUGH KYPHOPLASTY. A CASE REPORT

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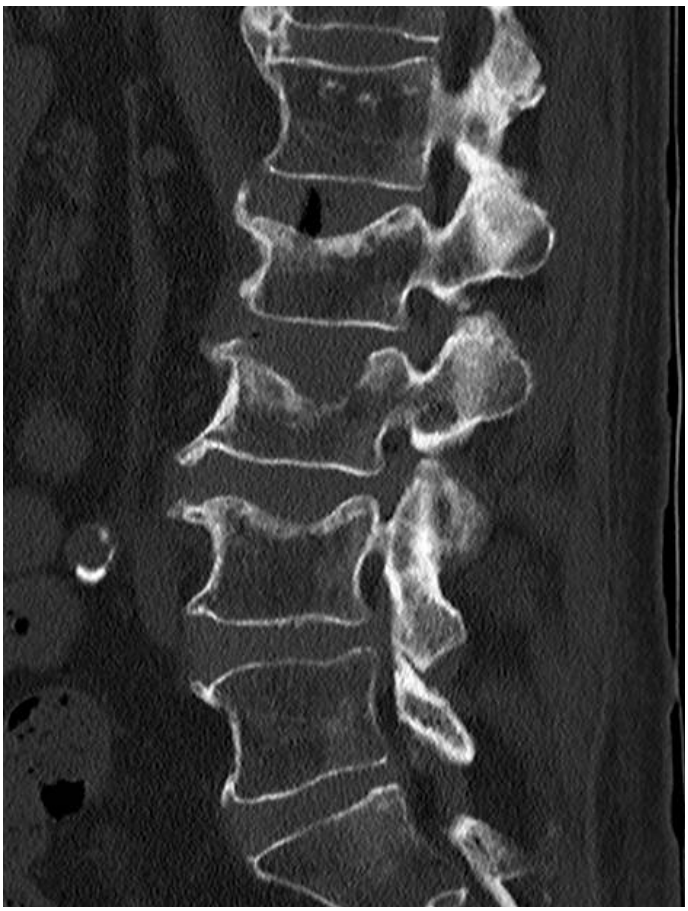
Objectives To analyze, through a clinical case, the effectiveness, outcomes, and complications associated with kyphoplasty in the treatment of vertebral fractures.

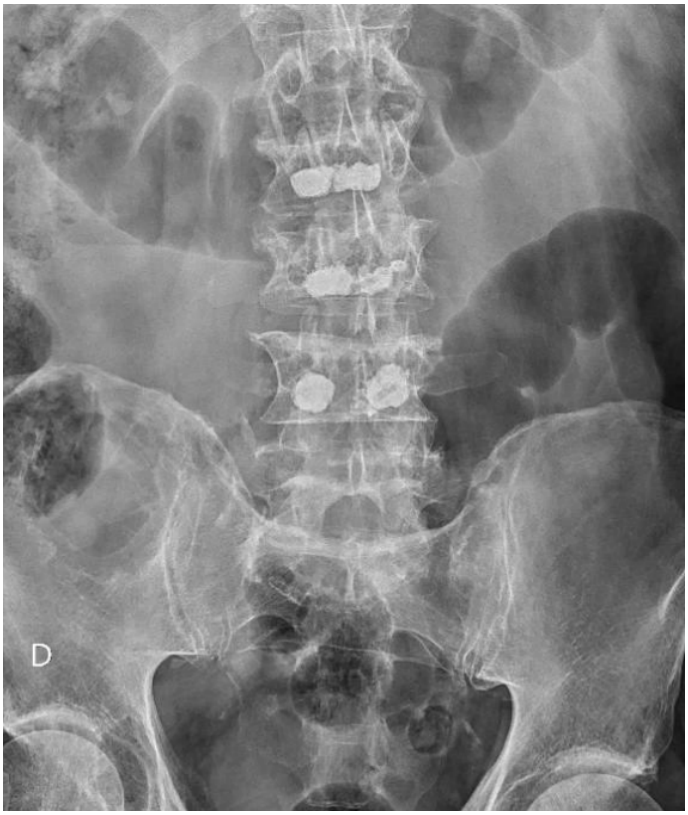
Materials and Methods A 73-year-old male patient presented with acute vertebral fractures at L2, L3, and L4 without accompanying neurological deficits. Additionally, a complementary study with Computed Tomography (CT) identified lytic lesions in the right hemipelvis, consistent with metastasis, likely related to Multiple Myeloma. After preoperative studies, the patient was deemed suitable for surgery. The surgical procedure consisted of kyphoplasty at three consecutive levels (L2, L3, L4) under general anesthesia, without intraoperative complications.

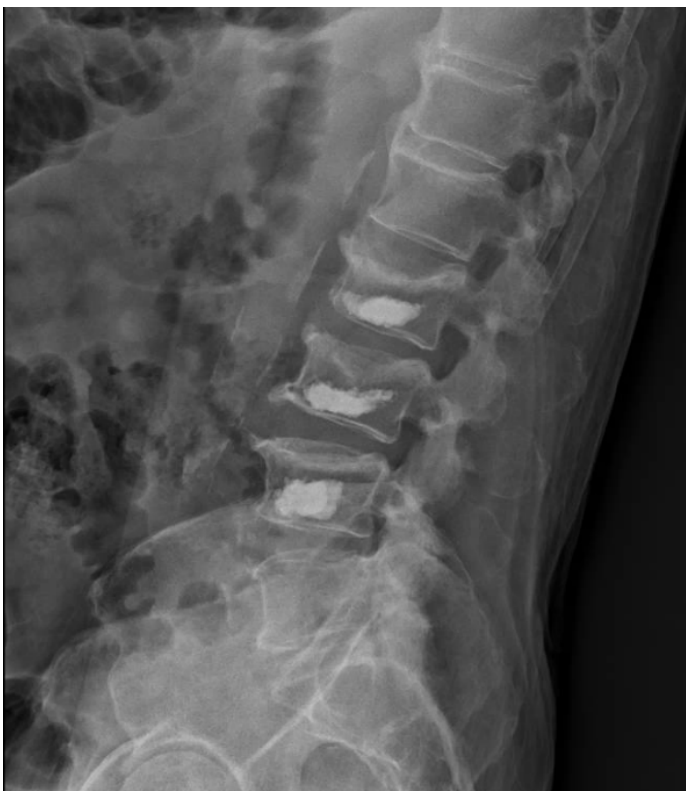
Results The patient in our case progressed favorably postoperatively, being monitored in the Intensive Care Unit and then transferred to the general ward where radiographic controls were performed, confirming the absence of complications. Postoperative pain decreased significantly, allowing for assisted ambulation and hospital discharge two days after the intervention.

Conclusions As exemplified by our case, kyphoplasty offers several advantages in the treatment of vertebral fractures, such as the restoration of vertebral height, immediate and long-term pain reduction, and functional improvement. This minimally invasive procedure carries a lower risk of complications compared to open surgery, allows for faster recovery, and enhances the patient's quality of life by reducing the disability associated with vertebral fractures.

Images (1 preoperative CT; 2-3: postoperative images)







P531

EXPLORING THE BARRIERS TO RESEARCH IN LONG-TERM CARE

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Objective(s) We face a rising aging population, many with complex health and social needs who will live in long-term care (LTC). This is an opportunity to examine the needs of residents in LTC to preserve their health and quality of life. Yet, residents in LTC are often excluded from research, and do not receive potential treatment benefits. The objective of this analysis was to understand participation barriers facing LTC homes that were invited to participate in research.

Material and Methods Recruitment included up to four invitations to participate through an introductory telephone or email invitation sent to the Administrator and/or Director of Care of each eligible (≥70 beds) LTC home. Second and third invitations to participate were sent 2-4 weeks apart with a final invitation 6-12 weeks after the introductory invitation.

Results A total of 454 eligible LTC homes in Ontario were invited to participate. A total of 143 (31.5%) homes expressed interest in participating in the study. Of the 143 homes, 48 (33.6%) declined participation, 1 (0.7%) did not respond after expressing interest, 12 (8.4%) were ineligible, 13 (9.1%) remain interested/unscreened, 66 (46.2%) were screened, 48 (33.6%) have been enrolled, and 3 (2.1%) withdrew from the study to date. Of the 48 homes enrolled, 27 (56.2%) are for-profit and 21 (43.8%) not-for-profit. A total of 33 (68.8%) homes were not-for-profit and 15 (31.2%) were for-profit that declined participation. The main reasons for not participating included: competing priorities/proj-

ects (22 (45.8%)), insufficient or changes to staff/organizational leadership (10 (20.8%)), duplication of current practice (4 (8.3%)), unknown (5 (10.4%)), or other (7 (14.6%)).
Conclusion(s) Many LTC homes continue to face challenges post-pandemic, including new legislation, increased oversight, staffing pressures, and negative portrayals. Despite these obstacles, LTC homes have the potential to improve residents' quality of life, particularly in areas like osteoporosis management and fracture prevention, by engaging staff in research. Overcoming these barriers will require a multifaceted approach, addressing institutional challenges (e.g., legal), fostering a research culture to mitigate biases, and building partnerships between researchers and LTC homes.

P532

ROLE TERIPARATIDE VS CALCITONIN ON TRANSFORAMINAL LUMBAR INTERBODY FUSION IN LUMBAR DEGENERATIVE DISEASE PATIENTS WITH OSTEOPOROSIS

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Introduction: Osteoporosis is a progressive metabolic bone disease that is characterized by a decrease in bone mass and density. TLIF is biomechanically a better technique for the treatment of degenerative lumbar disease. Teriparatide (rPTH) is the only anabolic agent that has been approved for the treatment of osteoporosis. The study aim was to evaluate the efficacy of teriparatide for TLIF in osteoporotic women.
Methods: 94-osteoporotic patients underwent TLIF surgery for degenerative lumbar spine disease. Patients were divided into two groups. The calcitonin group (n = 48) was administered nasal calcitonin (200 IU) for 2-months. The teriparatide group (n=46) was injected subcutaneously with teriparatide (20 ug/daily) for 3-month cycles. Serial plain x-rays, computed tomography, and bone mineral densitometry (BMD) evaluations were performed. Fusion rate, bony fusion duration, and T-score changes were evaluated. VAS and ODI were evaluated.
Results: The teriparatide group showed earlier fusion than the calcitonin group. The mean bone fusion period was 5.8±4.7 months in the teriparatide group but 9.4±5.2 months in the calcitonin group. The bone fusion rate in the teriparatide group was higher than that in the calcitonin group at 5-months; however, there was no difference after 12 and 24 months surgery. Pain scores and ODI were not significantly different between groups. BMD scores in the teriparatide group were significantly improved compared with the calcitonin group 2 years after surgery.
Conclusions: There was no significant improvement in overall fusion rate and clinical outcome in our patients after injection of teriparatide, but the teriparatide group showed early bony union and highly improved BMD scores.

P533

EFFECTIVENESS OF VERTEBROPLASTY WITH SHORT SEGMENT FIXATION VERSUS LONG FIXATION IN OSTEOPOROTIC VERTEBRAL FRACTURE

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Introduction: The thoracolumbar region is susceptible to injury because of its location between the stiff thoracic kyphotic and mobile lumbar lordotic. The OVCFs can lead to delayed union or non-union and lead to progressive collapse that can result in kyphosis with the possibility of neurological deficit. There is controversy regarding the ideal treatment for OVCFs. The study aim was to compare the safety and efficacy of vertebroplasty with short-segmented cement-augmented pedicle screws fixation and long-segment fixation for osteoporotic vertebral compression fractures (OVCF) in elderly patients.
Methods: A retrospective study of 182 single-level OVCF. 88 patients were treated by vertebroplasty and short-segment PMMA cement augmented pedicle screws fixation, and 94 patients were operated with long-segment posterior fixation. Local Kyphosis angle, vertebral height, VAS, ODI and neurological state were compared and analysed.
Results: 48.35% patients had short segment and 51.65% had long segment Spine fixation. Significant improvement was noted in VAS, ODI and neurological status in both groups. Mean kyphosis angle was corrected significantly from 19.08±4.9° preoperative to 6.49±2.59° immediate post-operative, and 8.62±2.60° at one year follow-up in short segment group In long segment group mean kyphosis was also corrected significantly from 23.20° ± 5.90° to 5.30°±3.9°immediate postop, and 8.60° ± 4.60° at one year follow-up. Anterior vertebral height was restored from 56.10±8.9 % to 85.9±11.2% postoperative in short segment group. In long-segment, it was restored from 55.80±11.9 to 87.6±13.1. Four case of cement leakage in short-segment group. In short-segment group, one patients had proximal junction failure, two had implant failure and it was four and six in long-segment group respectively.
Conclusions:
Both Short-segment and long-segment fixation can restore local kyphosis for osteoporotic vertebral fracture with lower complication and faster pain relief. A short-segment stabilization has faster relief of pain, lesser tissue destruction, minimise blood loss, shorter surgical duration with less stress risers at the junctional area.

P534

COMPUTED TOMOGRAPHY SCANS AS AN OPPORTUNISTIC SCREENING FOR OSTEOPOROSIS AND ITS COMPARISON WITH DEXA SCAN

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Introduction: Osteoporosis is a prevalent condition leading to an increased risk of bone fractures. Osteoporosis poses a worldwide public health concern, impacting over 200 million individuals and resulting in a staggering 1.66 million hip fractures each year. Opportunistic osteoporosis screening can be employed during CT scans to assess bone mineral density (BMD) through Hounsfield units (HU) without the need for additional imaging, radiation exposure, or appointments. This study aimed to investigate a CT scan's diagnostic value in the opportunistic osteoporosis screening through L1 vertebra densitometry and compare it with dual energy x-ray absorptiometry (DEXA) findings.
Methods: The cross-sectional study. A 298 patients with an average age of 67.71 ± 10.92 years were included in the study. An individual who underwent densitometry using the DEXA method between 2022 and 2023 and subsequently received CT scans within a 90-day window before or after were identified and had their radiology records reviewed. Individuals were categorized into three groups based on the T-score obtained through the DEXA method.
Results: The age of osteoporotic patients was significantly higher than osteopenia ($p = 0.001$) and normal individuals ($p < 0.001$). The HU of osteoporotic patients was found to be significantly lower compared to both osteopenia ($p = 0.023$) and normal individuals ($p < 0.001$). According to the ROC curve for osteoporosis prediction using the HU (AUC = 0.793 and $p < 0.001$), with a cut-off of 103 HU, the CT scan had a sensitivity of 69% and a specificity of 74% for the diagnosis of osteoporosis.
Conclusion: Individuals with osteoporosis exhibit a significantly lower average HU compared to both osteopenia and healthy individuals. A CT scan can serve as an effective predictor of osteoporosis in patients. The CT images obtained for reasons unrelated to osteoporosis diagnosis can be employed to discern patients with osteoporosis without incurring the added cost or radiation exposure.

P535

BONE MINERAL DENSITY AND TRIGLYCERIDES

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Objective: Osteoporosis, a condition characterized by the weakening of bones and increased fracture risk, presents a significant public health concern, particularly among the aging population. This disorder results from various factors, including hormonal changes, nutritional deficiencies, and lifestyle choices. Elevated triglyceride levels have been associated with an increased risk of osteoporosis, prompting investigations into the underlying mechanisms by which lipid metabolism may influence bone density and strength. Understanding this relationship is crucial, as it could lead to novel preventive and therapeutic strategies for individuals at risk.
Methods: The study included 225 patients who presented to the rheumatology clinic with complaints of degenerative joint pathology who had alterations in calcium and vitamin D levels. These patients were with no pathology or treatment that could affect bone or lipid metabolism. These patients were evaluated for serum lipid profile (in particular triglycerides values) and osteoporosis. Lumbar region, femoral neck and total hip BMD were measured by DXA; osteoporosis was defined as Tscore ≤ -2.5. Multivariable logistic regression models were used to test the associations of TG with osteoporosis.
Results: From 225 patients included, 71.8% of them were female. The mean age of patients was 66.4 years (SD = 7.6 years). The prevalence of osteoporosis was 11.2% in men and 42.1% in postmenopausal women. Each standard deviation (SD) increase in TG (OR: 1.74; 95 % CI: 1.28 – 2.48) was associated with increased risk of osteoporosis.
Conclusions: These results indicate that levels of TG were correlated with the risk of osteoporosis.

P536

BONE MANIFESTATIONS IN SYSTEMIC MASTOCYTOSIS: CASE REPORTS OF ARGENTINIAN PATIENTS

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Introduction: systemic mastocytosis (SM) is defined by the pathological proliferation and activation of mast cells. At the bone level, it can manifest as osteoporosis, osteosclerosis, or mixed focal lesions. The release of cytokines and inflammatory mediators promotes increased bone remodeling, typically characterized by a predominance of resorption over formation, leading to significant bone loss, osteoporosis and vertebral fractures.
Objective: emphasize the importance of bone involvement in SM through the presentation of three clinical cases.
Case 1. A 25-year-old male debuted with skin lesions. At 29 years, DXA L1-L4 showed a Z-score of -3.5 and triptase levels of 30 ng/ml. Bone marrow biopsy (BMB) confirmed a diagnosis of well-differentiated SM associated with low bone mass. He began daily imatinib and 4 mg zolendronic acid (ZOL) every 60 days, resulting in improved bone mass and no new fractures.
Case 2. A 30-year-old male with skin lesions and no gastrointestinal symptoms. At 42 years, develops bone pain and an atraumatic L2 fracture. At 44 years, DXA reveals low bone mass and L3 fracture. At 46 years, bone pain increases, and he suffers multiple

acute vertebral fractures (D1, D4, D8-D10, D12, L4, L5). Triptase level is 65 ng/ml. BMB confirms aggressive SM with cKit D816V+. Treatment with 4 mg ZOL/month for 12 months and midostaurin is initiated.

Case 3. A 40-year-old male presents an acute atraumatic L3 fracture, associated with a 10 kg weight loss, anemia, and an ESR of 92, with 5 months of evolution. Diagnosed with SM with bone involvement. Lytic lesions are observed in the axial and appendicular skeleton, along with splenomegaly. BMB reveals aggressive SM with cKit+. Treatment with cladribine is initiated, later switched to midostaurin due to disease progression. The patient develops sepsis and finally died.

Conclusions: Bone involvement is present at the time of diagnosis in 28-34% of cases and in 90% throughout the course of SM. These lesions, whether focal or diffuse, can be lytic, sclerotic, or mixed. Three cases of advanced SM in young adult males with severe bone involvement are presented, highlighting its impact on prognosis and quality of life for the patients.

P537

OLDER NASA ASTRONAUTS HAVE ELEVATED CORONARY ARTERY CALCIUM

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Objective: Older adults retain calcium and phosphate in the circulation (1,2), although the age at which this occurs is not determined. Since astronauts are known to lose bone during space flight, we asked if older astronauts are more prone to develop higher coronary artery calcium (CAC) scores and if these could be related to bone loss due to microgravity.

Method: We obtained from the National Aeronautics and Space Administration (NASA) a de-identified dataset on all NASA astronauts who flew missions to the International Space Station (ISS). Data included CAC Agatston scores from chest computed tomography at approximately 5 yr intervals, with an ISS space mission at some time within the interval but not individually disclosed in the de-identified data. The dataset also included changes in bone mineral density (BMD) of total hip, femoral neck and lumbar spine within 1 yr of space mission (pre-flight) and at 10d and 1 yr post-flight. Statistical analyses included unpaired and paired t-tests, Shapiro-Wilk normality of data distribution, non-parametric Spearman correlation coefficients, and inter-quartile distribution as appropriate.

Results: 52 astronauts spent a mean of 6 months in the ISS. CAC scores rose in 19 of the 52 (36.5%). These astronauts were significantly older than the remaining 33, 50.2 +/- 1yr vs 45.4 +/- 5yr, p=0.0057. CAC scores rose a median of 30 Agatston units in the older group. From ages 40-49 to 50-59, CAC rises a mean of 5.6 units/yr in people without cardiovascular disease (3). 7 of the 19 (37%) older astronauts had CAC rises from 6.8-21.3 units/yr. The rise in post-flight CAC did not correlate with the degree of bone loss.

Conclusions: Due to disparate sampling times, we could not correlate changes in CAC and bone density. However, the 37% CAC rise in older astronauts sparks concern about the risks of developing cardiovascular disease during prolonged space missions.

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P538

WHICH THRESHOLD VALUES OF CROSSLAPS TO TARGET TO PREVENT BONE LOSS AT 1 AND 2 YEARS AFTER DENOSUMAB DISCONTINUATION. THE REOLAUS STUDY

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Objective

After denosumab discontinuation (DD) elevated serum crosslaps (sCTX) is associated to bone mineral density (BMD) loss over a two-year period. Bisphosphonates reduce this rebound effect, especially if sCTX remain low. The objective was to define an sCTX threshold below which BMD gained on denosumab is maintained.

Material and Methods

Postmenopausal women receiving ≥2 consecutive denosumab doses and followed ≥2 years after DD with regular BMD and several sCTX measurements were included retrospectively. Lumbar spine (LS) T-score loss ≥0.2 SD defined the losers group. Linear regression analysis and ROC curves were performed to define sCTX threshold (in %ULN, upper limit of the norm; 573ng/l in our laboratory) preventing 1- and 2-year LS BMD loss.

Results

161 women received 8.0±2.9 injections; 50% were defined as losers 2 years after DD. Losers received more denosumab injections (9.0±2.8 versus 7.3±2.9, p=0.002). BMD at DD were similar at all sites in stable and losers groups. LS T-score decreased in losers after 1 (-0.38±0.40 versus -0.09±0.36 SD, p<0.001), and 2 years (-0.49±0.31 versus +0.09±0.25 SD, p<0.001). After 2 years, losers had lower LS T-score (-2.26±1.30 versus -1.75±1.10 SD, p=0.025). Two years after DD, BMD loss was highly correlated with sCTX increase during the first and during the two years on linear regression models (p<0.001). The best sCTX threshold sensitivity-specificity relationship to avoid LS BMD loss at 1 year and over 2 years was 69.3 (397.1ng/l) and 63.8 (365.6ng/l) %ULN, respectively; 32.2 (184.5ng/l) and 35.5 (203.4ng/l) %ULN respectively for a 100% sensitivity (ROC AUC 0.686 and 0.678). sCTX threshold during the first year to avoid LS BMD loss at 2 years was 49.1

(281.3ng/L) and 22.5 (128.9ng/L) %ULN for a 100% sensitivity (ROC AUC 0.674). More patients received ≥3 zoledronate infusions in the losers group (28% vs 7%, p=0.006).

Conclusions

sCTX level during the first year after DD predict 1- and 2-year BMD loss at LS. Strategy to maintain low sCTX level during this first year and regular sCTX monitoring are needed to avoid BMD loss. Maintaining sCTX below 49.1 %ULN during the first year prevent LS BMD loss at 2 years. Shorter denosumab treatments are encouraged. Despite high doses of bisphosphonates, it is not always possible to reach this target.

P539

IMPACT OF VITAMIN D DEFICIENCY ON MORTALITY IN PATIENTS WITH HIP FRACTURE: A META-ANALYSIS

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Objective: To assess the impact of different levels of vitamin D deficiency on mortality in patients with hip fractures and examine the influence of potential confounding factors.

Material and Methods: A systematic search of PubMed, EMBASE, Scopus, and Cochrane Collaboration Library was conducted, resulting in nine eligible cohort studies (n=4409). Patients with hip fractures were categorized based on their vitamin D levels as severe, moderate, or insufficient. Mortality was the primary outcome measure in this study. Subgroup analyses were performed according to the follow-up time. Odds ratios (OR) with 95% confidence intervals (CI) were calculated using a random-effects model in Review Manager 5.4.

Results: Nine studies, with a pool of 4,409 patients, were included. Vitamin D insufficiency was significantly associated with increased mortality (OR 1.24, 95% CI 1.05 to 1.46; I2 = 4%). Severe deficiency also led to a significant increase in mortality (OR 2.08, 95% CI 1.09 to 3.97; I2 = 42%), while moderate deficiency did not show a significant effect (OR 1.06, 95% CI 0.79 to 1.44; I2 = 0%). Subgroup analysis revealed significant associations between vitamin D insufficiency and increased mortality at one-year (OR 1.37, 95% CI 1.06 to 1.77) and two-year follow-up (OR 1.78, 95% CI 1.01 to 3.15). After adjusting for potential confounders, no significant increase in the mortality rate was observed.

Conclusion: This meta-analysis suggests that vitamin D insufficiency and severe deficiency are associated with increased mortality in patients with hip fracture. However, after adjusting for confounding factors, this association was not statistically significant. Further research is necessary to understand the role of vitamin D deficiency in this population.

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DOES VITAMIN D DEFICIENCY AFFECT FUNCTIONAL OUTCOMES IN HIP FRACTURE PATIENTS? A META-ANALYSIS OF COHORT STUDIES

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Objective: This study aimed to conduct a meta-analysis to quantify the effects of vitamin D deficiency on physical function and quality of life after hip fractures.

Methods: The PubMed, EMBASE, Scopus, and Cochrane Library databases were searched for relevant studies. The inclusion criteria were hip fracture, comparison between vitamin D deficiency and normal vitamin D levels in patients with hip fracture, and functional outcome as the primary outcome. The exclusion criteria were case reports, reviews, duplicates, studies with a high risk of bias, and non-comparable or missing data. Two independent reviewers selected studies, extracted data, assessed bias, and performed meta-analyses using the Review Manager. Heterogeneity and publication bias were also assessed. Two independent reviewers selected the studies, extracted data, and assessed the risk of bias. We performed a meta-analysis using Review Manager and assessed heterogeneity and publication bias.

Results: Seven studies with 1,972 patients were included. Vitamin D deficiency was defined as a 25(OH)D level <20 ng/mL. There were no significant differences in the ability to walk (OR 0.68, 95% CI 0.31-1.53, I2=69%) or length of hospital stay (MD 2.27 days, 95% CI -2.47 to 7.01, I2=93%) between patients with and without vitamin D deficiency. However, patients with vitamin D deficiency had significantly worse functional ability and quality of life (SMD -1.50, 95% CI -2.88 to -0.12, I2=96%).

Conclusions: Despite the limitations of this study, such as small sample size, heterogeneous outcome assessments, and variable vitamin D measurement techniques, the results demonstrated that screening for vitamin D status and optimizing levels through supplementation could facilitate rehabilitation, promote lifestyle changes, aid in the recovery of independence, and help reduce long-term burdens.

P541

SURVIVAL IMPACT OF PATHOLOGICAL FRACTURES IN METASTATIC CANCER: A COMPREHENSIVE META-ANALYSIS

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Objective: The aim of this study was to evaluate the survival of metastatic cancer patients with pathological fractures (PF).
Material and Methods: This study adhered to PRISMA guidelines and employed the PICOS strategy for inclusion criteria. A comprehensive search was conducted across multiple databases. The primary focus was on survival outcomes. Statistical analysis employed Review Manager 5.4.1, calculating mean differences for continuous variables and generic inverse variances for hazard ratios. Heterogeneity was assessed using Chi2 and I2 tests.
Results: A total of seven studies with 14,011 patients were included. Unadjusted hazard ratios (HRs) showed that PF increased the risk of mortality1.31 (95% CI 1.08 to 1.57). Adjusted HRs confirmed significant increase in mortality risk for PF HR 1.31 (95% CI 1.08 to 1.57). The PF group had significant lower mean survival (MD -14.50, 95% CI -22.95 to -6.05). PF increased mortality risk in studies including solid tumors overall (HR 1.32, 95% CI 1.12 to 1.56) and in leiomyosarcoma (HR 5.40, 95% CI 1.80 to 16.2).
Conclusion: PF increases the mortality risk and reduces the mean survival of patients with metastatic cancer.

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INCIDENCE OF VITAMIN D DEFICIENCY IN ADOLESCENT IDIOPATHIC SCOLIOSIS: A META-ANALYSIS

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Objective: This study aimed to investigate the incidence of vitamin D deficiency in patients with adolescent idiopathic scoliosis through a meta-analysis and to analyze trends and risk factors.
Material and Methods: Potentially relevant studies were searched using the terms "Vitamin D AND scoliosis." Data on the incidence and risk factors, such as race, curve magnitude, and sex, were extracted from the selected studies. Review Manager 5.4 software was used for data analysis. Six studies with a total of 1,428 patients met the inclusion criteria.
Results: The incidence of vitamin D insufficiency in patients with idiopathic scoliosis was 36.19% (95% CI [21.93 to 50.46]). In contrast, the incidence of vitamin D deficiency was 41.43% (95% CI [16.62 to 66.23]). Vitamin D levels were compared between Caucasian and African patients, and it was concluded that Caucasian patients had a lower risk of vitamin D deficiency (RR 0.15, 95% CI [0.03 to 0.82]; P = 0.03). There was also an association between patients with idiopathic scoliosis and lower vitamin D levels (-5.58, 95% CI [-7.10, -4.06]). Finally, no significant differences were observed in terms of curve magnitude assessed with the Cobb angle (mean difference [MD] 4.45, 95% CI [-0.55, 9.44]) or sex with lower-than-normal levels of vitamin D (OR 0.96, 95% CI [0.58 to 1.60]).
Conclusion: The incidence rates of vitamin D insufficiency and deficiency in patients with adolescent idiopathic scoliosis were 36.19% and 41.43%, respectively. The Caucasian race was associated with a lower risk of vitamin D deficiency compared to the African race. Vitamin D deficiency was not related to curve magnitude or sex.

P543

RADIOLOGICAL FEATURES OF VERTEBRAL FRACTURES IN MAJOR BETA-THALASSEMIA: IMPACT ON BONE INTEGRITY AND SPINAL INSTABILITY

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Purpose or Learning Objective
The objective of this study is to explore the radiological behavior of vertebral fractures in patients with major beta-thalassemia, focusing on the impact of the disease on bone integrity and the resulting spinal instability. The study aims to highlight how thalassemia affects bone quality, fracture healing, and the clinical implications for vertebral fractures, particularly in the context of reduced bone density and structural abnormalities.
Methods or Background
Beta-thalassemia major is a genetic hematological disorder characterized by defective hemoglobin production, leading to chronic anemia and compensatory mechanisms such as increased bone marrow activity. Over time, this can result in significant skeletal abnormalities, including reduced bone density, trabecular bone loss, and bone fragility. Imaging modalities such as MRI and CT are essential for assessing the effects of thalassemia on bone architecture and the response to fractures. These imaging techniques offer detailed views of bone density, fracture patterns, and instability, which are critical in understanding how the disease affects bone metabolism and fracture risk.
Results or Findings
Radiological findings in patients with major beta-thalassemia typically show reduced bone mineral density and altered trabecular structure, making the vertebrae more prone to fractures, even under low-impact trauma. MRI and CT scans often reveal vertebral fractures with significant instability, deformity, and displacement. In addition, the affected bones may show evidence of cortical thinning and irregularity, which further compromises their structural integrity. Despite the bone fragility, soft tissue involvement

is usually minimal, and nerve compression is uncommon.

Conclusion

In patients with major beta-thalassemia, the combination of low bone mineral density, altered trabecular architecture, and reduced bone healing capacity leads to an increased risk of vertebral fractures with spinal instability. Radiological imaging plays a crucial role in the early detection and management of these fractures. The findings suggest that thalassemia-induced bone changes require careful consideration in treatment planning, emphasizing the need for bone-strengthening therapies and careful monitoring to prevent further skeletal complications.

Limitations

No limitations were identified

Funding for this study

No funding was provided for this study.

P544

PHYTOCANNABINOIDS AND OSTEOBLASTOGENESIS: PRELIMINARY RESULTS OF HOW THESE NATURAL MOLECULES ENHANCE OSTEOBLASTOGENESIS

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Objectives: The endocannabinoid system (ES) has recently been recognized to be present in bone, playing a role in bone remodeling processes. The principal aim of this study was to investigate and demonstrate not only how the ES is involved in the osteoblastogenesis process but also to investigate how phytocannabinoids contained in Cannabis sativa could influence this process. **Materials and Methods:** Our experiments were conducted on a pool of four mesenchymal stem cell lines derived from adipose tissue, signed as PA Mix. To study the effects/role of ES on the osteoblastogenesis we have evaluated the in vitro effects of a range (i.e., 1nM-10nM-100nM-1μM-10μM) of anandamide (AEA), the principal endocannabinoid, of two phytocannabinoids (i.e., cannabidiol (CBD) and cannabigerol (CBG)) on osteogenic differentiation. Through TaqMan technology we have evaluated the expression levels of the osteogenic markers genes during osteogenic differentiation. Alkaline phosphatase (ALP) activity and hydroxyapatite (HA) deposits were evaluated through fluorometric and cytochemical assays. **Results:** AEA, CBD and CBG showed to induce a significant increase in ALP activity as well as an equal increase in the production of HA deposits during in vitro osteogenic differentiation of PA Mix line. Gene expression analyses revealed that AEA, CBD and CBG induced an early increase in the expression levels of osteogenic markers genes, too. Studies regarding the modulation of the components of the ES during the osteogenic differentiation process are now ongoing. **Conclusions:** Thanks to the established bioassay of PA Mix our findings indicate that the ES is really involved in the osteoblastogenesis and that can enhance this process. Our preliminary results seem really demonstrate that phytocannabinoids contained in Cannabis sativa could be really represent a future treatment of the bone loss and a treatment of all those pathologies which are characterized by an altered bone mineralization process. **Acknowledgements:** Supported by Fondazione Ente Cassa di Risparmio di Firenze

P545

PHYTOCANNABINOIDS AND THE ENDOCANNABINOID SYSTEM IN THE TREATMENT OF OSTEOSARCOMA

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Objectives: Several studies have recently shown that the endocannabinoid system (ES) plays an important role in neoplastic progression by promoting apoptosis and inhibiting cell proliferation in several tumors, among which we find primary bone tumors such as osteosarcoma. A bone tumor for which to date, despite multidisciplinary treatment, the survival rate five years after diagnosis is still very low. In light of the above, the development of specific in vitro bioassay for studying the role of ES in the physiology of osteosarcoma represents an important starting point both for understanding the role of ES in osteosarcoma progression and for understanding the effects of phytocannabinoids contained in Cannabis sativa on osteosarcoma progression. **Materials and Methods:** First, we have established a primary cell line from conventional osteosarcoma, from small cell osteosarcoma, and from telangiectatic osteosarcoma, respectively. All the cell lines have been established from bioptic samples collected at the "Unit Ortopedia Oncologica and Ricostruttiva", AOUC Careggi, Florence, previous signed informed consent approved by the local Ethical Committee. Through Taqman technology, we have evaluated the expression levels of the components of the ES in each established cell line. After, we have evaluated the effects of anandamide (AEA), the principle endocannabinoid, and of cannabidiol (CBD) on the proliferative activity of all the established cell lines. **Results:** The presence of the ES has been confirmed in all the established cell lines. The data obtained showed also that AEA and CBD are both able to reduce the proliferation rate of all tested cell lines. Studies regarding the possible role of AEA and of CBD on the metastatic potential of these three types of osteosarcoma are now ongoing.

Conclusions: Thanks to these established bioassays, one for each type of high-grade osteosarcoma, we confirmed, for the first time, the presence of the ES in osteosarcoma. We have also demonstrated for the first time a possible antineoplastic role of phytocannabinoids in high grade osteosarcoma progression, paving the way to find in phytocannabinoids new molecules to develop new therapeutic treatments based on the use of Cannabis sativa against osteosarcoma.
Acknowledgements: Supported by Fondazione Ente Cassa di Risparmio di Firenze

P546

ROUTINE HOME CARE DATA AS A TOOL FOR OSTEOARTHRITIS RESEARCH: ASSESSING FUNCTIONAL DECLINE, COMORBIDITIES AND MEDICATION PATTERNS

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Objective
The study aims to investigate if data collected via professional carers in a home care setting for service users with osteoarthritis match clinical experience, thus providing a set of frequently collected patient reported outcomes from elderly people.
Material and Methods
A retrospective analysis was conducted on data from digital care plans for 1196 osteoarthritic service users and a control group of 54764 service users. Care plans, compiled by professional carers with inputs from service users, are reviewed twice per year and contain demographics, comorbidities, medication regimens, and assessments of daily living activities (ADLs). For the study, the widely used WOMAC index was approximated by translating assessments of ADLs into an equivalent WOMAC score.
Results
Most of the study population was over 65 y.o.: 91% in the osteoarthritis cohort and 85% in the control group. 71% of osteoarthritic service users were women, only 37% in the control group.
Hypertension (35%), diabetes (26%) and chronic kidney disease (20%) were the most prevalent comorbidities observed with osteoarthritis.
The medication analysis showed that paracetamol, ibuprofen, aspirin and codeine were respectively prescribed for 20%, 5%, 6%, 3% of the osteoarthritis cohort and to less than 0.5% of the control group.
The approximate WOMAC score included 10 of the original WOMAC sections (see Table 1). 96% of the osteoarthritis cohort scored a total estimated WOMAC greater than 0, indicative of functional limitations, compared to 27% of the control group. Longitudinal analysis showed an increased approximate WOMAC score over time for 9% of the osteoarthritis cohort, compared to 5% in the control group.
Conclusion
The study demonstrates the feasibility of using real world data collected in a home care setting to investigate osteoarthritis in the elderly population. The findings, which align with established clinical knowledge, support the use of this approach to assess patient outcomes and disease progression, both in retrospective and prospective studies.

Table 1

WOMAC section	% of subjects with score > 0	
	Osteoarthritis cohort	Control group
Stiffness	17	7
Localised pain	23	8
Rising from sitting	13	8
Walking	41	26
Lying/rising from bed	24	16
Standing	34	22
In/out of bath	26	16
On/off toilet	20	13
Descending/ ascending stairs	12	7
In/out of car	5	2

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THE ASSOCIATION BETWEEN GUT MICROBIOTA AND SARCOPENIA AMONG THE ELDERLY: BIRJAND LONGITUDINAL AGING STUDY (BLAS)

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Background: Sarcopenia, a condition marked by age-related loss of muscle mass, strength, and physical ability, is a growing public health issue. It's linked to higher rates of illness and death, making it a significant concern, especially for older adults. Recent studies suggest that the gut microbiome might influence muscle health through what's known as the gut-muscle axis. This study explores the connection between gut bacteria and sarcopenia in older adults participating in the Birjand Longitudinal Aging Study (BLAS).
Methods: The study included 293 participants aged 60 and older from the BLAS cohort. Sarcopenia was diagnosed using the Asian Working Group for Sarcopenia (AWGS) 2019 criteria, which take into account muscle mass, handgrip strength, and walking speed. The researchers analyzed the composition of gut bacteria by sequencing the 16S rRNA gene from stool samples. They used

statistical models to examine the relationship between specific types of gut bacteria and sarcopenia, while adjusting for factors like age, diet, and overall health.
Results: Sarcopenia was found in 38.2% of the participants. Two types of bacteria, *Akkermansia* and *Lactobacillus*, were linked to a higher risk of sarcopenia. For every increase in their levels, the odds of having sarcopenia went up by 7% and 8%, respectively. On the other hand, *Roseburia* was associated with a lower risk of sarcopenia, with each increase in its levels reducing the odds by 11.5%. *Akkermansia* was also linked to lower muscle mass, weaker handgrip strength, and slower walking speed. In contrast, higher levels of *Roseburia* were tied to better physical performance.
Conclusion: This study suggests that gut bacteria may play a role in sarcopenia, with specific types like *Akkermansia*, *Lactobacillus*, and *Roseburia* showing strong connections to muscle health. These findings open up the possibility of using gut microbiome-targeted treatments, such as probiotics or prebiotics, to help prevent or reduce sarcopenia in older adults. However, more research is needed to confirm these links and explore how these treatments might work in practice.

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THE EFFECT OF WHOLE-BODY VIBRATION ON MUSCLE PARAMETERS, BIOMECHANICAL AND METABOLIC FACTORS IN DIABETIC SARCOPENIA: STUDY PROTOCOL OF A RANDOMIZED CONTROLLED CLINICAL TRIAL

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Background: Sarcopenia, characterized by a reduction in muscle mass and strength, can coexist with type Ⅱ diabetes, diabetic sarcopenia, leading to exacerbated muscle degeneration and blood factors dysfunction. Whole Body Vibration (WBV) as a physical therapy intervention has emerged as a promising intervention with potential benefits in muscle strength, balance, and blood factors. This study aims to evaluate the effects of WBV on muscle parameters, biomechanical and metabolic factors in older adults with diabetic sarcopenia through a randomized controlled trial protocol.
Methods: This study is a randomized controlled trial will enroll 60 individuals with diabetic sarcopenia. Participants will be randomly assigned to a WBV intervention group or a control group. The WBV group will undergo 36 treatment sessions over 12 weeks. While the control group will be recommended to receive standard care. Primary Outcomes include muscle mass and strength, biomechanical parameters, physical function, inflammatory biomarkers, and quality of life.
Results: Data will be collected and analyzed at baseline and post-intervention. A paired samples t -test will be used to compare within-group differences. An ANCOVA will be used to compare between-group differences. A two-sided P <0.05 will be considered statistically significant.
Conclusions: This trial will provide comprehensive data on the efficacy of WBV in managing diabetic sarcopenia, potentially offering a viable and practical intervention to improve muscle mass, muscle strength, and metabolic health, biomechanic parameters in walking and balance in this vulnerable population.

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MUSCULOSKELETAL DISORDERS IN THE TREATMENT OF OBESITY: A NARRATIVE REVIEW

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Obesity is a chronic condition that often comes with a range of complications, including musculoskeletal disorders (MSDs). Managing obesity typically involves weight loss through lifestyle changes, medications, or bariatric surgery. However, losing a significant amount of weight can sometimes have unintended effects, such as the loss of fat-free mass (FFM), which includes muscle and bone. This can worsen musculoskeletal health issues. This review explores how obesity treatments affect muscle and bone health and discusses ways to minimize these negative impacts.
To gather insights, we reviewed various studies that looked at how weight loss methods—like medications (e.g., GLP-1 receptor agonists) and bariatric surgery—affect muscle and bone health. We also examined research on sarcopenia, sarcopenic obesity, and changes in bone mineral density (BMD) after weight loss. The findings show that weight loss interventions, especially bariatric surgery and certain medications, often lead to a significant reduction in fat-free mass, including muscle. This can result in sarcopenia, reduced physical ability, and a higher risk of fractures due to weaker bones. In some cases, up to 25% of the total weight lost can come from muscle and bone, with older adults being particularly at risk. To combat this, it's important to focus on proper nutrition, especially getting enough protein, and incorporating strength training exercises to help maintain muscle and bone mass during weight loss.
While losing weight is crucial for managing obesity and its related health issues, it's equally important to address the potential risks to musculoskeletal health. A well-rounded approach that includes nutritional support and regular physical activity is key to preserving muscle and bone health, ensuring better long-term outcomes for obesity treatment. More research is needed to improve these strategies and develop new ways to protect musculoskeletal health during weight loss.

P550

10 YEAR TREND OF THE PREVALENCE OF KNEE OSTEOARTHRITIS IN JAPAN USING THE ROAD COHORT DATA

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[Objective]To unveil the long-term trend of prevalence in knee osteoarthritis in Japan.
[Material and Methods] In Japan, little is known about the prevalence of knee OA. To investigate the prevalence of Japanese population, we have initiated a large-scale nationwide cohort study known as Research on Osteoarthritis / Osteoporosis Against Disability (ROAD). In 2005-2007, we have recruited 3,040 participants (1,061 men, 1,979 women; mean age 70.3 years) over three diverse communities and set up a baseline survey. The Xray of knee joints was performed and we evaluated osteoarthritis (OA) of the knee joints by using Kellgren-Lawrence grading system. KL>=2 was diagnosed as knee OA. 10 years later, at the same three communities, we have conducted the fourth survey with 2,893 participants (895 men, 1,998 women; mean age 70.7 years), and compared the prevalence of knee OA between the baseline and the fourth survey.
[Results]We have already reported the prevalence of knee OA was 54.6% (men 42.0%, women 61.5%) at the baseline period. 10 years later, at the fourth survey, however, the prevalence of knee OA in 2,893 participants was 39.3% (men 26.9%, women 44.9%), which indicated prevalence of knee OA had gradually lowered in the 10 years (p<0.001). After the logistic regression analysis adjustment for age, sex, and area, the same tendency remained (p<0.0001).
[Conclusion]From the long-term observation results of the community-based cohort, it became evident that the prevalence of knee osteoarthritis (OA) is decreasing. We have already reported from the observation of the ROAD study that the prevalence of osteoporosis and degenerative hip OA is lower in the current generation compared to the same age group ten years ago. Similarly, in the long-term trend of knee OA, we observed a similar tendency. When combined with these results, it suggests that the bone and joint health of Japanese people is improving over the 10 years.

P551

FUNCTIONAL OUTCOMES AFTER ARTHROPLASTY USING THE "BIKINI" INCISION FOR HIP SUBCAPITAL FRACTURES

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Objectives
In recent years, more surgeons have opted for the anterior approach for hip replacement, a variation of which is the "Bikini" incision. This method is usually not only for arthroplasties after osteoarthritis, but also for hip fractures -although rarely. This study aims to document short-term outcomes in terms of functional recovery and complications in hip subcapital fractures after arthroplasty using the "Bikini» method.
Materials and Methods
This study included 31 patients with an average age of 81.32+-9.74 years and an average Body Mass Index (BMI) of 28.46+-6.25, who underwent total or partial hip arthroplasty after a subcapital hip fracture using the "Bikini" method. Postoperative complications and length of hospital stay were also recorded. The pain levels, the hip function, the balance, and the quality of life were evaluated using the Visual Analog Scale (VAS), the Harris Hip Score (HHS)(3), The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), the Time Up and Go (TUG) test, and the 36-Item Short Form Survey (SF-36) respectively. The evaluations were conducted preoperatively and postoperatively at 1,3, and 6 weeks and at 3 and 6 months. The Statistical Package for the Social Sciences (SPSS28.0) was used for the statistical analysis, which included tests for normality and the appropriate correlations between the variables at the assessed time points.
Results
Postoperative pain level was low on the VAS, with statistically significant differences in the 3rd week. The hip function and the walking speed showed improvement with statistically significant differences in the TUG test and WOMAC (p=0,004 and p=0,002 respectively) in the 6th week, while SF-36 values were high in every sub-category studied. Four postoperative complications were recorded: one of which was a delayed wound healing, a second was a seroma and two more were periprosthetic fractures.
Conclusions
The "Bikini" incision approach for treating hip fractures is recommended as safe and appears to shorten the hospital stay, reduce complication frequency, and promote recovery of the patients. Moreover, the low postoperative pain level rapid functional recovery, and patient independence, make it increasingly preferred for hip surgeries.
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P552

MONITORING THE STATE OF THE MUSCULOSKELETAL SYSTEM IN UNIVERSITY STUDENTS AS A PREDICTOR OF THE RISKS OF DEVELOPING ITS DISEASES

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Objective: Musculoskeletal disorders (MSD) are common among university students. This necessitates monitoring to identify MSD disorders in students in order to prevent the development of serious disorders in the future.
Methods: MSD disorders were monitored using the somatoscopic method, postural disorders were diagnosed by calculating the shoulder index according to V.K. Asymmetry was determined by measuring the distance from C7 (7th cervical vertebra) to the left - S1 and right - S2 scapula. Flat feet were determined by calculating the podometric index using the Friedland method. The reliability of the data obtained was assessed using Student's t-test. The closeness of the relationship between the obtained indicators was determined based on the Spearman rank correlation coefficient.
Results: During the somatoscopic examination of 83 students, 31.32% of the subjects had musculoskeletal disorders, 34.94% had flat feet of varying degrees, and 36.14% had asymmetry. Statistically significant ($p < 0.001$) gender differences in the studied parameters were found: 10.25% of boys had posture disorders, while 47.72% of girls had them. It was found that girls had more pronounced axial skeletal disorders with left-sided deformation. 5.13% of the examined boys had asymmetry: the difference in the distance from the C7 cervical vertebra to the shoulder blades varied from 1.5 to 2 cm. In 72.72% of girls, asymmetry varied from 0.5 to 2 cm. The incidence of flat feet in girls was 2.32 times higher than in boys. Calculation of the Spearman correlation coefficient (girls - $r = 0.311$; boys - $r = 0.4$) allowed us to identify a direct statistically significant ($p < 0.05$) relationship between the studied indicators (the value of the brachial index and the podometric index), the strength of the relationship according to the Chaddock scale is moderate. Statistically significant gender differences in the frequency of occurrence of combined disorders, which were 4.87 times ($p < 0.001$) more common in girls than in boys, may indicate the presence of physiological characteristics caused by complex hormonal changes in their bodies.
Conclusion: The results obtained indicate the need to monitor the state of the musculoskeletal system of students in order to identify functional disorders to prevent negative changes in the functioning of the body in the future.

P553

EFFECT OF TIBOLONE ON CORTICAL AND TRABECULAR BONE IN POSTMENOPAUSAL WOMEN COMPARED WITH ESTROGEN THERAPY

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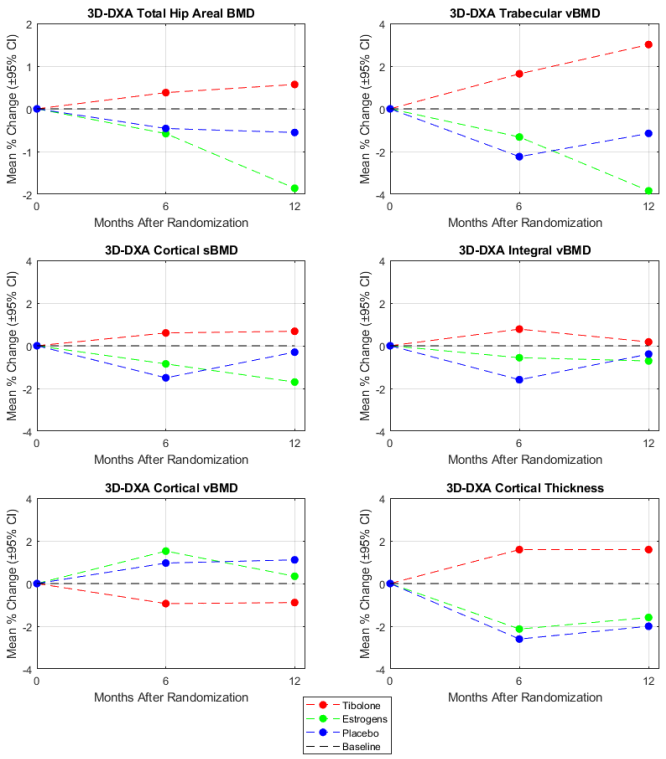
Objective: To evaluate the effects of 2.5 mg/day of tibolone compared to 0.625 mg/day of estrogen and placebo on cortical and trabecular bone in postmenopausal women at 6 and 12 months of treatment.
Material and Methods: A randomized controlled trial was conducted in postmenopausal women from Mexico City. Participants were divided into three groups: A) Tibolone 2.5 mg/day, B) Conjugated estrogens 0.625 mg/day with medroxyprogesterone 5 mg/10 days, and C) Placebo.
Hip aBMD was assessed at 6 and 12 months. Cortical and trabecular bone measurements were obtained using 3D modeling from DXA scans (3D-SHAPER v2.10.1, Galgo Medical, Spain). Parameters included cortical vBMD, cortical thickness, cortical surface BMD, and trabecular vBMD. Comparisons between groups were performed for these measurements.
Results: There were 22 participants in the tibolone group, 27 in the estrogen group, and 22 in the placebo group. At 6 months, hip aBMD increased by 0.34% in the tibolone group but decreased by 0.47% and 0.31% in the estrogen and placebo groups, respectively. Comprehensive vBMD increased by 0.77% in the tibolone group and 0.11% in the estrogen group, while it decreased by 1.04% in the placebo group. Trabecular vBMD increased by 1.51% and 0.65% in the tibolone and estrogen groups, respectively, but decreased by 1.5% in the placebo group. Cortical thickness increased by 1.69% in the tibolone group but decreased by 2.17% and 2.75% in the estrogen and placebo groups, respectively. 3D modeling provided valuable insights into whether changes in DXA aBMD were driven by trabecular or cortical compartments, highlighting more pronounced improvements in the tibolone group.
Conclusions: Tibolone therapy demonstrated a trend toward improvement in all parameters, with increases of up to 2% at the 6-month mark. These findings suggest tibolone could be a viable alternative to hormonal therapy, offering similar BMD benefits with fewer adverse effects. Greater improvements are expected with continued treatment at 12 months.
Figure 1. Changes in cortical and trabecular bone measured with 3D DXA.



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ASSOCIATION BETWEEN VERTEBRAL COMPRESSION FRACTURES AND LIFESTYLE HABITS

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[Objective] Japan is becoming a super-aged society, and the number of osteoporosis patients is increasing. It is known that vertebral compression fractures caused by osteoporosis have a significant impact on life prognosis as well as on the decline in activity. Lifestyle and nutritional intake, especially calcium intake, are also considered important in the prevention of osteoporosis. The purpose of this study was to evaluate and compare the relationship between vertebral compression fractures and lifestyle habits and calcium intake status.
[Subjects and Methods] This study included 477 female patients aged 50 years or older who underwent bone mineral density measured by dual-energy X-ray absorptiometry and completed a questionnaire at our clinic between November 2023 and October 2024. We used a medical questionnaire to investigating fracture risk factors (fracture history, symptoms, medical history, glucocorticoid use, etc.), lifestyle habits (walking duration, sun exposure, regular exercise, childhood exercise, dieting experience, smoking, alcohol consumption, etc.), dietary preferences, and calcium intake. We evaluated the relationship between vertebral compression fractures and the items in the medical questionnaire, extracted significant factors as explanatory variables, and performed logistic multivariate analysis (P<0.05).
[Results] Multivariate analysis identified the following factors as significantly associated with vertebral compression fractures: age (p=0.009), BMD T-score (p=0.018), history of respiratory disease (p=0.017), lack of childhood exercise experience (p=0.009), and low milk consumption frequency during elementary and middle school (p=0.031).
[Discussion] The present study suggests that increased age, low bone mineral density, history of respiratory disease, no childhood exercise experience, and low frequency of milk intake during elementary and middle school may be associated with the occurrence of vertebral compression fractures. These results reaffirm the importance of past and present lifestyle optimization and nutritional management in the prevention of osteoporosis. Further studies with a larger number of cases and multifaceted investigations that take other relevant factors into account are needed in the future.

P555

BISPHOSPHONATES AND ORAL HEALTH: BRIDGING KNOWLEDGE GAPS AMONG DENTISTS

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Background/Aims: Bisphosphonates (BPs), powerful pharmacological agents that inhibit bone resorption, are frequently used in rheumatology. Dentists play a crucial role in educating patients treated with these drugs, particularly regarding the risk of osteonecrosis of the jaw (ONJ). Our objective was to assess dentists' knowledge and practices concerning BPs. **Methods:** This was an observational, cross-sectional study conducted among dentists. They were invited to complete an anonymous, self-administered questionnaire distributed via Google Forms. The questionnaire covered the demographic characteristics of the practitioners, their knowledge, and their practices regarding the oral health management of patients on BPs. **Results:** A total of 46 dentists (41 women and 5 men) responded to the questionnaire. The average age was 32.5 ± 4.78 years, and the average duration of practice was 6.17 ± 4.43 [1-21] years. Fifty-seven percent (55.3%) of practitioners worked in a public setting. Forty participants (87%) reported seeing fewer than five patients on BPs per month, 10.9% (n=5) saw between five and ten patients, and 2.2% (n=1) saw more than ten. Seventeen percent of them had observed at least one case of BP-induced ONJ. According to the participants, the indications for BP use were as follows: osteoporosis (according to 89.1%), bone metastases (according to 80.4%), multiple myeloma (according to 45.7%), Paget's disease (according to 39.1%), and primary hyperparathyroidism (according to 2.2%). Three participants did not know any indications for BPs. Regarding associated adverse effects, all participants recognized ONJ, but only 56.5% mentioned atypical fractures, and 23.9% noted gastrointestinal issues. The risk factors for ONJ identified included the injectable

form of BPs (n=35), recent tooth extraction (n=33), the malignant nature of the underlying disease (n=18), corticosteroid use (n=14), and untreated periodontitis (n=13). Half of the dentists (n=53) believed that tooth extraction should be performed before starting BP therapy. Additionally, 59.4% felt that mucosal healing time is essential, while 43.4% considered that bone healing is desirable. Among the participants, 53.8% felt that their level of knowledge was sufficient, while 29.2% reported lacking knowledge. Only 17.9% had attended specific training on BPs. Furthermore, 95.3% (n=101) of them recommended the development of national guidelines in collaboration with various specialists. Conclusion: This study reveals that while Tunisian dentists are generally aware of the risks associated with BPs, particularly ONJ, gaps remain in their knowledge of other adverse effects and in the management of patients on these treatments. Enhancing continuous education and establishing appropriate protocols will help improve the quality of oral care for at-risk patients.

P556

PREVALENCE AND ASSOCIATED FACTORS OF FIBROMYALGIA IN PATIENTS WITH DIABETES MELLITUS

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Objective:
The aim of this study is to evaluate the prevalence of fibromyalgia (FM) among patients with diabetes mellitus (DM) and to explore possible contributing factors.
Material and methods:
This is a cross-sectional study collecting data from patients with DM. Demographic characteristics, hemoglobin A1c (HbA1c) levels, type of diabetes (DM1 or DM2) and complications related to disease were collected. Patients with diabetic neuropathy or musculoskeletal disorders were excluded. All participants completed the Fibromyalgia Rapid Screening Tool (FiRST) questionnaire. A diagnosis of fibromyalgia was considered if a score of at least 5 out of 6 is achieved. Statistical analysis was performed using SPSS software, with a significance threshold set at $p<0.05$.
Results:
One hundred patients (61 men and 39 women), with a mean age of 57.6 ± 13.5 years, were included. Of these, 94% had DM2 and 6% had DM1. The median disease duration was 8.5 [0-37] years. Thirteen patients (13%) had microvascular complications: diabetic retinopathy (n=5) and diabetic nephropathy (n=14). Fifty-four patients (54%) were insulin-dependent. The disease was poorly controlled in 40% of patients with a median HbA1c level of 8.6 [4.7-18.9] %.
According to the FIRST, 46% of patients had FM with a mean FiRST score of 3.08 ± 2.04. In the analytical study, FM was significantly associated with the following parameters: older age ($p=0.001$), female sex ($p<0.0001$), longer disease duration ($p<0.0001$) and higher HbA1c level ($p=0.04$). A significant positive correlation was noted between the FiRST score and age ($r=0.344$; $p<0.001$) as well as the duration of the disease ($r=0.49$; $p<0.001$). However, no association was found between the occurrence of FM and these parameters: type of DM ($p=0.68$), insulin therapy ($p=0.67$), the presence of diabetic retinopathy ($p=0.62$) or nephropathy ($p=0.38$).
Conclusion:
Our study shows a high prevalence of concomitant FM in patients with diabetes mellitus. Optimal disease control and regular screening of FM—particularly in patients with risk factors—are mandatory to improve clinical outcomes.

P557

ANNOUNCING JUVENILE IDIOPATHIC ARTHRITIS: CHALLENGES ENCOUNTERED BY TUNISIAN RHEUMATOLOGISTS

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Objectives: The aim of this study was to assess the perception of Tunisian rheumatologists when faced with the need to announce the diagnosis of Juvenile idiopathic arthritis (JIA).
Material and Methods: We conducted a cross-sectional descriptive study among Tunisian rheumatologists. Participants were invited to answer an anonymous web-based questionnaire. The data were analyzed with descriptive statistics using the SPSS statistical package.
Results: A total of 34 rheumatologists (30 women and 2 men) responded to the questionnaire. The mean age was 31.5 [26-43] years. They were as follows: 44.1% residents (n=15), 41.2% (n=14) rheumatologists in the public sector and 14.7% (n=5) rheumatologists in the private sector. Overall, 64.7% (n=22) of participants provide care for paediatric patients. Only 5.9 % of them report receiving courses in the field of announcing the diagnosis of JIA. Physicians assessed their general self-efficacy in communication skills as follows: 17.6 % (n=6) good, 55.9% (n=19) satisfactory and 26.5% (n=9) poor.
At JIA announcement, 44.1% (n=15) of participants claim that they always explain the disease to the parents and 44.1% (n=15) of them assert that they do so frequently. Furthermore, 20.6% (n=7) of rheumatologists consistently involve the children, while 76.5% (n=26) adapt their approach depending on the age of the child. Only 47.1% (n=16) of physicians use resources when announcing JIA: therapeutic patient education sessions (39.4%), explanatory brochures (18.2%), videos (6.1%) and continuing professional training courses (3%).
The dominant reported feelings when announcing the diagnosis were as follows: empathy (n=27), anxiety (n=11), apprehension (n=4), and confidence (n=9). According to participants, the main challenges include: effectively managing the patient's emotions (n=27), answering family questions (n=25), tailoring information to the child's age (n=24), offering sufficient emotional support (n=19) and empathizing with the child (n=16).

Conclusion: This study illustrates the challenges faced by Tunisian rheumatologists when announcing JIA. Many of them report not being properly trained to cope with this situation. These findings underscore the need to target the training gaps in communication skills among these physicians within this field.

P558

EVALUATION OF FUTURE RHEUMATOLOGISTS' KNOWLEDGE ON TRANSIENT SYNOVITIS OF THE HIP

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Objectives:
Transient synovitis of the hip (TS) is a common childhood condition. While typically benign, it's crucial to be distinguished from more severe causes of acute hip pain in children. The aim of this study is to assess the level of knowledge of future rheumatologists on TS.
Material and Methods:
We conducted a cross-sectional descriptive study among Tunisian young rheumatologists. Participants were invited to answer an anonymous web-based questionnaire. The data were analyzed with descriptive statistics using the SPSS statistical package.
Results:
A total of 28 residents with a mean age of 28.9 [26-35] years, responded to the questionnaire. The sex ratio (M/F) was 0.12. Overall, 85.7% (n=24) of participants reported encountering less than five cases of TS during their medical training, while 14.3% (n=4) encountered between five and ten cases. Regarding the definition of TS, 85.7% (n=24) of residents picked the correct answer. Twenty-two participants (78.6%) correctly identified the age range associated with TS, while 24 participants (85.7%) indicated that this condition is more common in boys. Participants identified the following etiological factors of TS: recent infection (n=26), seasonal variation (n=16) and history of trauma (n=2).
According to 78.6% (n=22) of rheumatologists, this affection is considered a diagnosis of exclusion. Most of them (64.3%) acknowledged that the diagnosis is based on ultrasound findings, particularly the presence of hip effusion. Participants recognized the following conditions as potential differential diagnoses of TS: septic arthritis and osteomyelitis (n=28), slipped capital femoral epiphysis (n=21), fracture (n=13), and Legg-Calvé-Perthes disease (n=9). Most of rheumatologists (n=27) acknowledged rest and non-steroidal anti-Inflammatory drugs as effective treatments, while 14.3% of them (n=4) considered traction as a part of the therapeutic management for TS.
Conclusion:
Our study suggests that future rheumatologists have a good knowledge of TS. Therefore, implanting practical and motivational training methods appears essential to optimize their management of this paediatric condition.

P559

ARTIFICIAL INTELLIGENCE IN OSTEOPOROSIS MANAGEMENT: REVOLUTION OR ILLUSION?

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Objective:
Artificial intelligence (AI) is transforming medicine, including rheumatology. However, its application in osteoporosis (OP) management remains limited and poorly understood by practitioners. This study aims to explore rheumatologists' perceptions regarding the use of AI in OP management.
Material and Methods:
A cross-sectional descriptive study, with an anonymous questionnaire composed of 17 questions, designed with the Google Forms software, was sent to Tunisian rheumatologists. The data were analyzed with descriptive statistics using the SPSS statistical package.
Results:
A total of 62 participants responded to the questionnaire (56 women and 6 men). The mean age was 36.5 [25-70] years. Participants were as follows: 43.5% (n=27) residents, 46.7% (n=29) rheumatologists in the public sector and 9.7% (n=6) rheumatologists in the private sector. About 54.8% (n=34) of participants had already used AI in their clinical or research practice and 24.2% (n=15) of them had received training in it. Only 19.4% (n=12) of rheumatologists were familiar with AI applications in rheumatology.
According to participants, AI could improve the diagnosis of OP (77.4% of responses), the screening of OP (90.3% of responses) and patients 'monitoring (83.9% of responses). Moreover, 78.2% of rheumatologists believe that AI could identify at-risk patients through computerized records that consider risk factors and medical history. For management and monitoring, 74.2% of participants thought that AI could improve these aspects through smart mobile applications dedicated to patients.
Rheumatologists' expectations also include time-saving (72.6%), improved personalized follow-up (69.4%) and early detection of complications (64.5%). However, the challenges of using IA in OP are, in their opinion: professional resistance (61.3%), lack of training (59.7%), technology reliability (56.5%) and ethical and legal issues (53.2%).
Overall, 74.2% of rheumatologists believed AI could transform the management of OP in the next five years, while 25.8% remained skeptical. Furthermore, 93.5% of participants expressed interest in additional information on AI advancements applied to OP and wished to receive dedicated training.
Conclusion:
AI is seen as having significant potential for OP management, but efforts in training and awareness are needed to overcome the identified obstacles.

P560

CALCIUM AND VITAMIN D DISTURBANCES IN PATIENTS WITH INFLAMMATORY BOWEL DISEASES

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Objective:
During inflammatory bowel diseases (IBD), chronic inflammation can lead to poor absorption of calcium and vitamin D (VD). Moreover, variants of VD receptors were reported to contribute to susceptibility to IBD. The objective of our study was to assess calcium and VD metabolism in patients with IBD and establish their relationship with disease activity.

Material and methods:
A retrospective study was conducted, including patients with Crohn's disease (CD) and ulcerative colitis (UC). Clinical and biological data were collected: body mass index (BMI), hemoglobin (Hb), C-reactive protein (CRP) and bone profile. The severity of IBD flare-ups was assessed using Harvey-Bradshaw index (HBI) for CD and Mayo score for UC. Statistical analysis was carried out using SPSS software, with a significance threshold set at $p<0.05$.

Results:
Sixty patients (48 men and 12 women), with a mean age of 44 ± 15.9 years, were included. Median disease duration was 9.2[1-31] years. For CD patients, 37% of patients had the stenosing phenotype and 62% had ileocolic involvement. UC Phenotypes were as follows: pancolitis (15%), left-sided ulcerative colitis (13%) and distal ulcerative colitis (11%). IBD was associated with spondyloarthritis in 18.3% of cases. Mean HBI and Mayo scores were 2.8 ± 1.3 and 4.1 ±1.8 respectively.
Median Hb and CRP levels were 12[9-16]g/dl and 12[1-97]mg/dl respectively. Median serum calcium and phosphate levels were 2.29 [2.0-2.58] mmol/l and 0.78[0.67 -1.60] mmol/l respectively. Overall, 11% of patients had hypocalcemia. VD serum, measured in 25 patients, was abnormal in all patients: insufficiency (48%) and deficiency (52%).
Significant correlations were identified: a positive correlation between serum calcium and Hb (r=0.281 p=0,039), VD levels with BMI (r=0.469; p=0,024) and VD with Hb (r=0.5; p =0,019). Negative correlations were found between VD and respectively: HBI score (r=-0.536;p=0.039) and CRP(r=-0.38;p=0.05).

Conclusion:
Our study showed that anemia, inflammation and the severity of CD flare-ups are associated with VD deficiency. These findings emphasize the need for regular monitoring and early management of calcium and VD disturbances in patients with IBD.

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ADHERENCE TO ALLOPURINOL AND ASSOCIATED FACTORS AMONG TUNISIAN PATIENTS WITH GOUT

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Objective:
Gouty arthritis is a metabolic arthropathy caused by the deposition of monosodium urate crystals within joint spaces. Long-term urate-lowering treatment is essential to control serum uric acid levels (SUA) and prevent severe complications. This study aimed to assess allopurinol adherence among patients with gouty arthritis and identify the factors influencing this adherence.

Material and methods:
A cross-sectional study was carried out including patients with gout *(ACR/EULAR 2015 criteria)*. Treatment adherence was assessed using the "5-item Compliance Questionnaire for Rheumatology (CQR-5)." The questionnaire consists of five items measuring patients' perceptions of their treatment, with four response options on a four-point scale ranging from "Strongly disagree" (1) to "Strongly agree" (4). Patients were considered "good adherents" if their total score was greater than 8. Factors associated with good adherence were also studied. Statistical analysis was performed using SPSS software, with a significance threshold set at $p<0.05$.

Results:
Overall, 51 patients (34 men and 17 women) were included. The mean age of patients was 60.3 ± 10.9 years. Among patients, 37.3% (n= 19) were smokers and 27.5% (n=14) consumed alcohol. Comorbidities were as follows: 60.8% (n= 31) dyslipidemia, 52.9% (n=27) hypertension, and 47.1% (n=24) diabetes. Allopurinol was taken by 68.6% (n=35) of patients, with a mean dose of 155.7 ± 70.5 mg. Seven patients (13.7%) presented with kidney stones. The mean SUA was 468.1 ± 123.3 µmol/L. Among patients, 45.1% were classified as "poor adherents" and 54.9% as "good adherents." Good adherence was associated with non-diabetic patients ($p = 0.004$) and lower SUA ($p = 0.003$). No association was found between good adherence and the following parameters: age, gender, smoking, alcohol consumption and disease duration.

Conclusion:
Adherence to Allopurinol continues to be a significant challenge for patients with gouty arthritis, with a considerable number showing poor adherence. Providing proper therapeutic education is crucial to enhance adherence. The CQR-5 questionnaire might be an effective and useful tool for evaluating this adherence.

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PODIATRIC MANIFESTATIONS OF RHEUMATOID ARTHRITIS: A STATUS REPORT IN A TUNISIAN POPULATION

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Introduction:
Rheumatoid foot is a common manifestation of rheumatoid arthritis (RA) that can significantly impair quality of life. This study aims to evaluate the clinical and podiatric characteristics of this condition in a Tunisian population.
Methods:
This descriptive study included patients diagnosed with RA according to the 2010 ACR/EULAR criteria. Demographic, clinical, and podiatric data were collected.
Results:
The study included 40 patients with a mean age of 58.45 ± 10.85 years [range 31–83], and a female-to-male sex ratio of 5.6. The mean age at RA onset was 45.15 ± 10.9 years, and the mean disease duration was 13.33 ± 7.8 years. The mean DAS28 (CRP) score was 4.06 ± 1.38, the mean HAQ score was 1.44 ± 0.73, and the mean walking distance (MWD) was 386 meters. Twenty-seven patients (67.5%) had an MWD of <500 meters.
Foot pain, assessed using a visual analog scale (VAS), had a mean score of 6.17 ± 1.5. The most frequently affected areas were the forefoot (42.5%), ankle (35%), hindfoot (27.5%), and midfoot (20%). Deformities were present in 80% of patients, primarily hallux valgus (55%), claw toes (45%), and quintus varus (17.5%).
Podoscopic examination revealed plantar footprint abnormalities in 60% of patients: flat feet (40%), high-arched feet (20%), hindfoot valgus (22.5%), or hindfoot varus (12.5%). Excessive plantar pressure was observed in 52.5% of cases, and areas of insufficient pressure at the toes were noted in 47.5% of cases.
Conclusion:
The rheumatoid foot is characterized by pain, deformities, and podiatric abnormalities that significantly affect function and mobility. These findings highlight the importance of early and multidisciplinary management to mitigate these disabling conditions.

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POLYACRYLAMIDE HYDROGEL FOR KNEE OSTEOARTHRITIS: 5-YEAR RESULTS FROM A PROSPECTIVE STUDY

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Introduction
Polyacrylamide hydrogel (iPAAG), is CE marked for treating symptomatic knee osteoarthritis (OA), meeting the need for an effective, long-lasting, and safe non-surgical option. This study evaluates the efficacy and safety of a single 6 ml intra-articular injection of iPAAG in participants with moderate to severe knee OA over a 5-year post-treatment period.
Methodology
This prospective multicentre study (3 sites in Denmark) involved 49 participants (31 females) with an average age of 70 (range 44 – 86 years). They received a single 6 mL iPAAG injection. All participants provided informed consent and re-consented to continue after 1 year. The study followed GCP principles and was approved by Danish health authorities and local Health Research Ethics committees. One of the sites closed after the first year, while twenty-seven participants from the other sites completed the 5-year follow-up.
The study evaluated WOMAC pain, stiffness, function, and Patient Global Assessment (PGA) of disease impact. Changes from baseline were analysed using a mixed model for repeated measurement (MMRM). Sensitivity analyses were applied on the extension data, where the MMRM analysis was repeated only including patients in the extension phase and an ANCOVA model was used, replacing missing values at 5-years with baseline values (BOCF).
Results
The originally planned MMRM analysis including all available data from the 49 treated participants showed a statistically significant decrease in WOMAC pain scores (-14.6; 95% CI: -21.4; -7.7) from baseline to 5 years. The analysis only using data from the extension phase participants (n=27) showed similar results (-15.6; 95% CI: -22.3; -8.9). The BOCF analysis also showed a clinically relevant and statistically significant decrease in the WOMAC pain subscale from baseline (-9.1 units).
Seven new adverse events were reported between the 4-year and 5-year visits, with two reported as serious (acute myocardial infarction and femoral neck fracture). None of these seven events were related to the treatment.
Conclusions
This study shows that single injections of 6 ml intra-articular iPAAG were well tolerated and continued to provide clinically important effectiveness at 5-years after treatment.
Acknowledgements
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IMPACT OF ISLAMIC PRAYER PRACTICE ON KNEE OSTEOARTHRITIS

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Introduction :
The relationship between religious practices and health has

gained increasing interest in recent years, highlighting the potential impact of beliefs on the physical and psychological well-being of patients. Studying the influence of Islamic prayer on degenerative rheumatic conditions holds particular significance.
The objective of this study was to evaluate the impact of daily Islamic prayer practice on knee osteoarthritis.

Methods :

This was a cross-sectional study including patients diagnosed with knee osteoarthritis according to the ACR 1986 criteria. Parameters related to knee osteoarthritis were collected, including disease duration, pain assessment using the visual analog scale (VAS), walking distance, Lequesne index, and radiological classification. Participants were also surveyed about the modalities of their religious practices. Statistical significance was set at $p<0.05$.

Results :

A total of 47 female patients were included. The mean age was 61 years [40–80], and the average body mass index (BMI) was 29 kg/m² [21–36]. Forty percent of participants were unemployed. Occupations involving prolonged standing were noted in 27% of cases, prolonged sitting in 12%, and sustained physical activity in 14%.
Twelve percent of patients engaged in regular physical activity. Twenty-nine percent were diabetic, 42% hypertensive, and 23% had dyslipidemia.
The mean pain VAS was 3/10 [0–9], with an average walking distance of 864 m [100–2000]. The mean Lequesne index was 7 [0–19]. According to the Kellgren-Lawrence classification, 44% of participants were at stage 2, 32% at stage 3, 15% at stage 1, and 9% at stage 4. Analgesics were prescribed in 89% of cases and NSAIDs in 27%. Corticosteroid injections and viscosupplementation were prescribed in 10% and 8% of cases, respectively. No patient had undergone total knee replacement.
All participants practiced Islamic prayer. The mean age at the onset of prayer practice was 36 years [12–66], with an average duration of 26 years [2–50]. On average, participants performed 9 prayers [5–20] per day.
No correlation was found between the duration of prayer practice and either pain VAS or Lequesne index. However, a significant correlation was observed between the duration of prayer practice and walking distance ($p<0.001$), as well as the radiological stage of osteoarthritis ($p<0.001$). The number of prayers was positively correlated with pain VAS ($r=0.1$, $p<0.001$), Lequesne index ($r=0.1$, $p<0.001$), and radiological stage ($p<0.001$).

Conclusion :

This study underscores the need for an integrated and holistic approach to health that considers individuals' physical, cultural, and religious dimensions. Targeted interventions aimed at adapting prayer postures to alleviate pain may contribute to improving the quality of life and well-being of individuals within the Muslim community.

P566

ASSOCIATION OF RISK FACTORS WITH FALLS IN MIDDLE-AGED PARTICIPANTS: A CROSS-SECTIONAL STUDY

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Objectives
We aim to explore the association between demographic, behavioral, physical performance, and self-reported factors and falls in middle-aged outpatients at an urban hospital.
Material and Methods
This cross-sectional study was conducted at a single urban hospital, involving 179 participants aged 45–65 years. Data on demographics, fall history, and behavioral factors were collected using structured questionnaires. Physical performance was assessed using the Timed Up and Go test. Statistical analyses, including independent t-tests and logistic regression, were performed to examine associations between these factors and self-reported falls in the past year.
Results
Among the 179 participants, 13.4% reported at least one fall in the past year. Logistic regression analysis identified female gender as significantly associated with increased fall risk (Odds Ratio [OR] = 5.05, 95% Confidence Interval [CI]: 1.11–22.96, p = 0.036). Longer Timed Up and Go test completion times were significantly associated with a higher risk of falls (OR = 2.83, 95% CI: 1.18–6.81, p = 0.019). Other variables, such as age and self-reported health conditions, showed no significant associations with falls.
Conclusions
Female gender and longer Timed Up and Go test completion times are significantly associated with falls in middle-aged outpatients. Improving physical performance, particularly among women, could help reduce fall risks. Further research is warranted to validate these findings and refine prevention strategies.
Disclosures: All authors declare no conflict of interests.

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BENEFITS OF A DEMINERALIZED BONE MATRIX IN OSTEOPOROTIC INTERTROCHANTERIC FEMORAL FRACTURE PATIENTS

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Objective: Osteoporosis causes various fixation failures in patients with intertrochanteric fractures. This study aimed to investigate the effect of a demineralized bone matrix (DBM) for

cancellous or cortical bone defects on internal fixation in older osteoporotic patients with intertrochanteric fractures.
Materials and Methods: Among patients with intertrochanteric fractures who underwent surgical treatment from January 2019 to December 2023 at a facility, 171 patients were AO/OTA type 31-A1 and type 2 fractures which are considered relatively stable. The patients were grouped based on DBM use (Group A: DBM use, Group B: DBM non-use), and their clinical and radiology results were analyzed retrospectively. The patients were then subdivided into Group A-a and -b after removing factors that could cause treatment failures, such as the reduction status and location of the helical blade, and then further subdivided (Group A-a-1/2/3/4 and Group B-b-1/2/3/4) according to cancellous or cortical bone defects that could accompany intertrochanteric fractures. The time to full weight-bearing (FWB) and Harris hip score (HSS) 3 months after surgery in these subgroups were investigated.
Results: There was no significant difference in the clinical radiology results and complications between Group A and Group B. However, the time to FWB (p<0.001) and HSS (p=0.029) were significantly superior in Group A. In Group A-a with DBM use, after removing the risk factors for intertrochanteric fracture failure, the time to FWB (p=0.055) was close to the significance level, and HSS (p=0.036) was significantly superior. In Group A-a-1 (cancellous defect only) and Group A-a-3 (cancellous and cortical defect), the time to FWB (p=0.088, 0.052) was close to the significance level, and the HSS (p=0.039, 0.018) was significantly superior when DBM was used.
Conclusion: In patients with intertrochanteric fractures of AO/OTA type 31-A2.3 or less, if stable reduc tion and firm fixation are achieved, selective DBM use may help early recovery after surgery.

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RISK FACTORS ASSOCIATED WITH THE INCIDENCE OF FRACTURES IN GLUCOCORTICOID TREATED PATIENTS

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Objective
Our group has previously reported the prevalence and risk factors associated with the development of osteoporosis (OP) and fractures (fxs) due to chronic glucocorticoid (GC) treatment in a cohort of 127 patients with autoimmune diseases[1]. After clinical assessment, antiosteoporotic treatment (AOT) was prescribed according to clinical practice guideline recommendations.
We aimed to analyze the incidence of new fxs in this cohort at 5 years of follow-up, adherence to the AOT and identify risk factors related to the development of new fragility fxs (FF).
Material and Methods
The cohort of 127 patients was re-evaluated after 5 years of follow-up. The clinical data collected included: incidence and location of new and previous FF (vertebral fractures [VF]+peripheral fxs), dose and GC-treatment duration and/or time since discontinuation, anthropometric data, adherence to AOT, bone mineral density BMD analysis (DXA; defining OP as a T-score ≤-2.5), trabecular bone score (TBS) (defining degraded microarchitecture [DMA] as <1.230), dorsolumbar X-ray (assessing VF) and baseline FRAX risk (GC-adjusted), among others.
Results
Of the 127 patients in the initial study, 109 (18 deaths) were re-evaluated, 66.1% being women. The mean age was 65.4±18.3 years and they were treated with a median GC dose of 2.5 [0-5] mg/day (25.7% ³5mg/day) for 76 months; 48 (44%) patients had discontinued GC treatment 31 [8.88-49.2] months before evaluation.
AOT was prescribed to 81 patients in the baseline assessment, with 38.27% (31/81) of the patients currently continuing this treatment.
During follow-up, 13/109 patients (11.9%) presented fragility fxs (FF), 9/13 were VF and 7/13 were peripheral. Patients with new VF were older (88 vs.67 years, p=0.006), with higher baseline FRAX risk (3.6 vs.2.3, p=0.037 and 12.7 vs.7, p=0.017 for hip and FMOP, respectively), with a longer AOT discontinuation period (p=0.03), higher frequency of previous VF (OR 4.83; 95%CI 1.04-21.3, p=0.039) and hip fx in parents (OR 9.63; 95%CI 1.79-56.7, p=0.003). Similar results were found when analyzing the FF, except for the FRAX risk; the number of falls in the previous year were associated with an increased risk of peripheral fxs (OR 2.03; 95%CI 0.99-4.18, p=0.034), especially ≥2 falls (OR 10.4; 95%CI 1.18-94.3, p=0.044). Neither BMD nor TBS values were related to the development of new FF.
Conclusions
Age, history of previous VF, family history of hip Fx and falls in the previous year were the main risk factors related to incident fxs during the follow-up. In addition, a higher baseline FRAX risk and longer AOT discontinuation period were also associated with fx development, indicating the importance of evaluating these factors in these patients.
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P569

UTILITY OF VERTEBRAL FRACTURE ASSESSMENT (VFA) FOR THE IDENTIFICATION OF VERTEBRAL FRACTURES IN GLUCOCORTICOID-INDUCED OSTEOPOROSIS

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Objective

Glucocorticoid-induced osteoporosis (GIOP) is one of the most common forms of secondary osteoporosis (OP) and up to 50% of the patients may develop fractures (Fx), vertebral Fx (VF) being the most common. X-ray is the gold-standard diagnostic test, although VF can be identified by VFA using DXA when bone mass is measured, making it particularly useful for assessing GIOP.

We aimed to analyse the usefulness of VFA in identifying VF in patients treated with glucocorticoids (GCs) versus X-ray.

Material and Methods

127 patients on chronic GC treatment (≥5mg/day) were included (mean age 62±18 years, 63% women) in this cross-sectional study. All patients underwent dorsolumbar X-ray to assess VF (using Genant criteria[1]) and DXA (Lunar Prodigy) to analyse VFA from T4 to L4. Concordance between the two techniques was analysed with the kappa index: a value ≥0.41 was considered moderate, ≥0.61 substantial and ≥0.81 almost perfect. The sensitivity and specificity of VFA compared with X-ray were also assessed. Discordant cases were re-evaluated and consensus was achieved by two independent observers, also analysing the reasons for discordance.

Results

Of the 127 patients, X-ray showed at least one VF in 21 (16.6%) patients with a total of 39 VF. The Table shows the concordance results for VFA compared to X-ray for each vertebra, including the true positive (T+ [VFA+ and X-ray+]), false negative (F- [VFA- and X-ray+]), false positive (F+ [VFA+ and X-ray-] and true negative (T- [VFA- and X-ray-]) values.

Vertebra	T+	F-	F+	T-	Kappa
T4	0	1	2	124	-0.011
T5	1	3	3	120	0.226
T6	1	0	1	125	0.663
T7	1	1	2	123	0.388
T8	0	2	2	123	-0.016
T9	0	1	2	124	-0.011
T10	3	0	2	122	0.742
T11	5	4	1	117	0.647
T12	2	4	2	119	0.376
L1	5	1	0	121	0.905
L2	0	2	0	125	0.000
L3	0	1	3	123	-0.012
L4	0	1	1	125	-0.008

Concordance was poor for most of the vertebrae analysed, with high kappa index variability. Similarly, concordance by vertebral segments was moderate at T9-T12 and L1-L2 (k= 0.536 and 0.513 respectively) and low at T4-T8 (k= 0.245). Overall concordance was low (k= 0.444) with a low sensitivity (46%) but high specificity (99%). The main causes of discordance were vertebral deformities due to degenerative changes and scoliosis, and definition problems in the upper thoracic vertebrae (T4-T8).

Conclusions

VFA has a low sensitivity for identifying VF in GC-treated patients. However, its high specificity allows correct identification of subjects with VF and thus those who require anti-osteoporotic treatment. Nevertheless, concomitant performance of a radiological study is recommended in these patients.

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P570

THE EFFECTIVENESS OF OSTEOPOROSIS SELF-MANAGEMENT COURSE TO PROMOTE LONG TERM HEALTH BEHAVIOR

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Objective

Around 336,000 people have osteoporosis in Finland. Annually, 45,000 osteoporotic fractures with nearly 9,000 hip fractures cause a significant economic burden and impair quality of life.

Finnish Osteoporosis Association organizes courses which aim to strengthen self-management of osteoporosis by promoting knowledge, motivation and health among the participants. The course consists of five three-hour group sessions over a 10–14-week period.

The aim of the study was to examine the effectiveness of Osteoporosis Self-Management Courses in Finland. A post-course survey was conducted for the participants regarding their initial health behavior changes and their persistence for 3 to 6 months after the course ended.

Material and Methods

The results are based on cross-sectional survey data between

January 2021 to July 2024. The data consisted of 397 course participants, with 390 women and 7 men, with the mean age of 69.4 years. A total of 316 individuals responded to the post-course survey. The survey included 15 questions consisting of self-management of osteoporosis, resources, perceived physical function, motivation and commitment to self-management of osteoporosis.

Results

Altogether, 96% of the responders reported at least one change in their health behavior during the self-management course. The results were persistent in the follow-up surveys. Most significant changes were seen in increased protein intake (74%) and physical exercise (69%). The least changes were observed in the responders' meal patterns (28%). The responders reported increased knowledge (+36%), skills (+32%), and resources in osteoporosis management (+14%) and perceived physical function (+14 %). In addition, motivation and commitment to self-management of osteoporosis increased during the course, either somewhat or significantly (100%).

Conclusion

The Osteoporosis Self-Management Course can be considered an effective tool to achieve better management of the disease and persistent changes to health behavior among the participants.

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EPIDEMIOLOGY OF HIP FRACTURE IN ZIMBABWE AND DEVELOPMENT OF A COUNTRY-SPECIFIC FRAX MODEL

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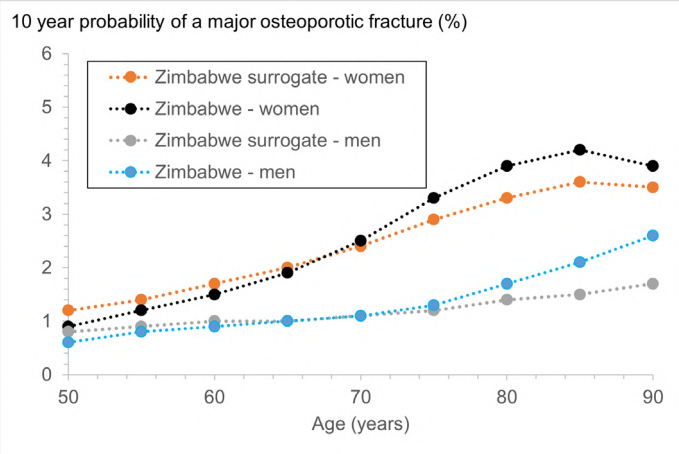
Objective Zimbabwe has previously relied on a surrogate FRAX® model for fracture risk assessment, using fracture incidence from South Africa. Data on the incidence of hip fracture have recently become available for Zimbabwe. Our aim was to develop a corresponding country-specific FRAX® tool from these data and compare fracture probabilities with the previous surrogate model.

Methods Numbers of hip fractures (ICD 10: S72.0, S72.1, S72.2) were retrieved from seven hospitals in Harare Province in Zimbabwe for two years (October 2021 – October 2023). These data were used to derive age- and sex-specific incidence of hip fracture in Zimbabwe residents and, combined with national mortality rates (United Nations (UN), 2020-2024), were used to create a FRAX® model for Zimbabwe. The 10-year probability of a major osteoporotic fracture (MOF) was used to compare the Zimbabwe model and the previous surrogate FRAX model for Zimbabwe. Examples are given for individuals with no clinical risk factors, body mass index (BMI) 25 kg/m^2, and unknown bone mineral density (BMD). The hip fracture incidence and UN population data were used to calculate the estimated number of fractures nationally in 2020 and 2050.

Results In total 243 hip fractures were identified (133[54.7%] female). The Zimbabwe model gave similar 10-year fracture probabilities for men and women compared to the previous surrogate model for Zimbabwe (figure). There were very close correlations (r=0.99) in fracture probabilities between the surrogate and authentic models, so that the use of the authentic Zimbabwe model had little impact on the rank order of risk. When the fracture incidence from Harare was applied to the population of Zimbabwe, it was estimated that 1030 hip fractures arose in 2020 in individuals over the age of 50 years, with a predicted increase by approximately 3.1 times to 3283 in 2050.

Conclusion The FRAX model should enhance the accuracy of determining fracture probability among the Zimbabwe population and help guide treatment decisions.

Figure The 10-year probability of a major osteoporotic fracture (%) for an individual with no clinical risk factors, BMI 25 kg/m^2, and BMD unknown.



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ASSESSMENT OF A MACHINE LEARNING MODEL FOR EARLY FRACTURE RISK PREDICTION IN CANCER PATIENTS RECEIVING OSTEOPOROSIS CARE

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Background: Cancer patients undergoing treatments like chemotherapy, hormone therapy, and corticosteroids, or experiencing decreased physical function, face a higher risk of osteoporosis and related fractures. Fractures in these patients can disrupt treatment and negatively impact quality of life, making early risk prediction and preventive measures critical. In this study, we utilized data from our cancer osteoporosis outpatient clinic to develop and validate a machine learning model with PredictionOne® to assess fracture risk.

Methods: The study included 279 cancer patients who attended our osteoporosis clinic from 2021 to 2023. Data was divided into a training set (189 patients) and a validation set (90 patients). Using PredictionOne® (Sony Network Communications Inc.), we developed a model based on patient demographics and clinical information, including age, gender, cancer type, previous fractures, height, weight, BMI, hip YAM score, TBS score, dental visit history, post-visit dental collaboration, follow-up duration, and cancer-related mortality. Fracture outcomes in the validation group were used to assess model accuracy.

Results: The model showed a weak positive correlation (correlation coefficient: 0.38) between predicted and actual fracture occurrences. Sensitivity and specificity were recorded at 1.0 and 0.89, respectively, indicating the model's effectiveness in identifying fracture risks with some limitations.

Discussion: Although the model showed promise in identifying fracture risk among cancer patients, the weak correlation and risk of false positives highlight the need for improved accuracy. Additional clinical features and refined feature selection may enhance predictive performance in future applications.

Conclusion: The PredictionOne®-based machine learning model demonstrated potential as a predictive tool for fracture risk in cancer patients. However, further refinement and larger datasets are essential to improve its clinical utility.

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GARRÉ OSTEOMYELITIS: AN ATYPICAL NEW REPORT

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Background

Garré sclerosing osteomyelitis is a rare condition with limited cases reported in the literature. It predominantly affects children and young adults, with the mandible being the most involved site. The diagnosis of Garré osteomyelitis is one of exclusion, as its imaging findings overlap with those of bone osteosarcoma and other aggressive conditions, including osteoid osteoma, Ewing sarcoma, and eosinophilic granuloma.

This report describes a novel case of Garré osteomyelitis involving the iliac crest, successfully treated with bisphosphonates.

Abstract

A 24-year-old patient presented with complaints of persistent pain in the right iliac crest region, without an identifiable triggering factor. Her medical history was notable for familial Leber's disease, left-sided hypoacusis due to tympanic membrane perforation at age three, a pineal brain cyst monitored by neurosurgery since 2019, and chronic migraines since 2017.

The pain originated six years earlier with an inconsistent pattern, transitioning from minimally symptomatic phases to persistent pain, exacerbated particularly at night. She also reported hyperalgesia phases where even light contact on the iliac crest was intolerable. Notably, she experienced significant weight loss of 25 kg over two months in 2016. A recent career change coincided with worsening pain in the iliac crest and hip region.

Clinical examination revealed a limp, but Trendelenburg sign was negative. Palpation of the right iliac crest elicited excruciating pain, while the left side was painless. Both hips had full and preserved mobility. Imaging studies, including a pelvic CT scan, lumbar and pelvic MRI, and whole-body MRI, showed hyperostosis lesions in both iliac wings. The inflammatory marks were normal. Histopathological analysis showed hyperostosis with thickened bony trabeculae, focal chronic and acute inflammation, and remodeling of the medullary stroma with edema. Immunohistochemistry using CD138 confirmed the presence of plasma cells, leading to a diagnosis consistent with Garré osteomyelitis.

Based on a literature review, treatment with bisphosphonates was initiated. The patient experienced complete pain relief after the first injection of Bonviva (ibandronate) 3 mg.

Conclusion

This case highlights the importance of histopathological findings and the exclusion of common differential diagnoses in establishing the diagnosis of Garré osteomyelitis. Bisphosphonates proved to be a promising therapeutic option, demonstrating efficacy in alleviating pain in this patient. Further studies are warranted to explore the broader applicability of bisphosphonates in similar cases.

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HEREDITARY MULTIPLE EXOSTOSES: CLINICAL FEATURES AND COMPLICATIONS IN AN ADULT COHORT

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Background.
Hereditary multiple exostoses (HME) is one of the most common benign musculoskeletal disorders. It is caused by genetic disorder with an autosomal dominant pattern of inheritance, characterized by the presence of at least two osteochondroma bony outgrowths. While it is generally considered as benign disorder, complications can significantly impact the disease outcome. These complications include nerve entrapment, compression, and malignant transformation into chondrosarcoma.
The objective of our study was to describe the clinical features of patients with HME and to determine the frequency of associated complications in this condition.
Methodology.
We conducted a retrospective study including adult patients with HME. Data recorded included sociodemographic features and disease characteristics (clinical manifestation, complication, involved sites). Radiographic data were also collected.
Results:
We included 21 patients with HME comprising 7 women and 14 men. The median age of the cohort was 43 years (range: 18–84), and the median age of diagnosis was 6 years (range: 2–14).
Most patients underwent surgical ablation of osteochondromas during childhood, with several interventions ranging from 0 to 9. Notably, 43% of patients inherited the mutation from their maternal family.
Seven patients were asymptomatic, and 14 reported clinical manifestations including arthralgia, articular limitation, and legs discrepancy (7, 14 and 4 patients, respectively).
The radiological findings showed the Madelung deformity in 6 patients (28.5%) and bilateral coxa vara in all patients.
Whole-body MRI revealed a peripheral distribution of osteochondromas in all patients. Axial involvement was identified in 13 patients, distributed as follows: pelvic involvement: 10 cases (47.6%), costal : 7 cases (33.3%) and rachis involvement: 2 cases (9.5%)
Regarding the HME complications, low-grade chondrosarcoma was diagnosed in 2 patients. Fibular nerve compression occurred in 1 case. Costal involvement was complicated by local respiratory dysfunction in one patient and local compression in another.
Conclusion:
The variability of the clinical patterns and the frequency of complications have been previously described in the literature. Our cohort underscores the need for close monitoring to prevent complications.

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ASSOCIATION BETWEEN PHYSICAL ACTIVITY AND SKELETAL MUSCLE MASS AND FUNCTION IN PATIENTS UNDERGOING PERITONEAL DIALYSIS : BASED ON THE ISOCHRONOUS SUBSTITUTION MODEL

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Objective: This study aimed to explore the association between physical activity (PA) and skeletal muscle mass and function in patients undergoing peritoneal dialysis (PD) based on the isochronous substitution model (ISM).
Methods: From March 2023 to February 2024, a cross-sectional survey was conducted among 643 PD patients from two hospitals in China. Based on AWGS 2019, skeletal muscle index (SMI), handgrip strength (HGS), 5-times sit-to-stand test (5-STS) were performed to assess skeletal muscle mass and function respectively . The Chinese version of the Low-physical activity Questionnaire (LoPAQ) was used to assess the PA level.
Results: Light physical activity (LPA) was associated with higher HGS and shorter 5-STS time, but there was no significant relationship with SMI. The results showed that when 10 minutes of LPA was used to substitute for daytime inactivity, the SMI level of patients increased significantly (β=0.007, 95%CI: 0.001~0.013, P<0.05), the HGS increased significantly (β=0.118, 95%CI: 0.031~0.149, P<0.001), and the 5-STS time was shortened (β=-0.045, 95%CI: -0.078~-0.012, P<0.01). Also, when 10 minutes of walking was used to substitute for daytime inactivity, the 5-STS time of patients was also shortened (β=-0.077, 95%CI:-0.135~-0.019, P<0.05). Logistic regression showed that there was no significant statistical relationship between LPA, moderate-to-vigorous physical activity (MVPA), and the occurrence of sarcopenia. Ten minutes of LPA or MVPA or walking was substituted for daytime inactivity had no significant statistical effect on the occurrence of sarcopenia.
Conclusion: Clinician should encourage patients to replace sedentary or prolonged lying during the daytime with LPA or walking in an isochronous manner, which can improve skeletal muscle mass and physical performance function in PD patients. The Walking and LPA may have positive implications for the prevention and adjuvant treatment of PD-related sarcopenia.

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RETROSPECTIVE COMPARATIVE STUDY OF THE INTRAOPERATIVE FRACTURE GAP COMPRESSION IN THE TREATMENT OF INTERTROCHANTERIC FRACTURE USING PROXIMAL FEMORAL NAIL ANTIROTATION

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Objective: Intertrochanteric fractures can be treated using proximal femoral nail antirotation (PFNA). This study examined the clinical and radiological results of the intraoperative fracture compression.

Materials and Methods: Ninety-four patients underwent intraoperative compression (Group I), and 88 patients underwent natural sliding only (Group II). The patients were followed-up for more than two years. All patients met the following seven conditions: (1) AO/OTA 31-A1, A2 type intertrochanter fracture, (2) availability of compression of more than one cortical bone in the anterior or medial region of the fracture site under the preoperative imaging test, (3) Singh index grade ≥3, (4) blade position: center-center, center-inferior, (5) tip-apex distance <25 mm, (6) reduction status of good or very good, and (7) positive or neutral medial cortical support position with slightly valgus reduction.

Results: A slight tendency toward significant differences in acute phase pain between the two groups was observed at six weeks postoperatively (p=0.073). Twenty-four months after surgery, lateral extension of the PFNA helical blade between the two groups showed significant differences (p=0.017). Fracture gaps measured immediately after surgery showed significant differences (p=0.001), and a clear tendency for a significant difference in the average fracture union time was found (p=0.065).

Conclusion: Intraoperative fracture compression, intraoperative fracture compression appears beneficial to achieve a successful union of trochanteric fractures provided that all conditions are met to apply the method safely.

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DISCONTINUATION AND NON-PUBLICATION OF CLINICAL STUDIES ON OSTEOARTHRITIS (EXCLUDING KNEE JOINT) IN 8,931,447 PATIENTS

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Objectives: While knee osteoarthritis (KOA) has been extensively studied and remains a primary focus of osteoarthritis (OA) research, OA of other joints (hip, hand, ankle, and shoulder) receive comparatively less attention. Many clinical studies are discontinued or remain unpublished, which limits the availability of evidence to guide clinical practice. The lack of dissemination restricts the evidence base and may expose patients to medical interventions without proven benefits. This study aims to assess the prevalence, characteristics, and publication history of non-KOA clinical studies and investigate reasons for their non-publication or discontinuation.

Methods: We conducted a comprehensive search of ClinicalTrials.gov for non-KOA studies up to January 12, 2025. We excluded studies completed within the last 24 months to allow for ongoing peer review. Published trials were determined through their NCT identifiers. We collected and analyzed data on gender, age, study type, funding source, intervention type, enrollment size, and location were extracted. Multiple logistic regression analyzed characteristics linked to unpublished or discontinued trials.

Results: A total of 1,456 registered osteoarthritis studies were reviewed, divided into 832 (57.14%) completed, 298 (20.47%) discontinued, and 326 (22.39%) remained with unknown status. Completed and discontinued studies were analyzed, including 862 interventional studies (76.9%) and 259 observational studies (23.1%). Among these, 298 were discontinued, with 9.7% of them being published despite being discontinued, and 35.9% of unknown studies were also found published. As for publication, Industry-funded studies were significantly more likely to be published than non-industry-funded studies (OR = 0.326, 95% CI: [0.213–0.497], p < .001), Studies with more than 100 participants were significantly more likely to be published than those with fewer than 100 participants (OR = 0.459, 95% CI: 0.3268 to 0.646, p <.001), and Studies using behavioral interventions were significantly more likely to be published than those using device interventions (OR = 2.950, 95% CI: 1.525 to 5.706, p < .001).

Conclusion: Non-KOA osteoarthritis studies are often discontinued or left unpublished, limiting the evidence base needed to guide clinical practice and improve patient outcomes. Factors such as funding source, enrollment size, and intervention type play a significant role in the likelihood of study completion and publication. Addressing these gaps through stricter regulatory policies, transparent reporting practices, and enhanced funding strategies is crucial to reducing research waste and advancing osteoarthritis management.

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THE RELATIONSHIP BETWEEN ENTHESITIS INDICES AND DISEASE ACTIVITY PARAMETERS IN IRAQI PATIENTS WITH ANKYLOSING SPONDYLITIS

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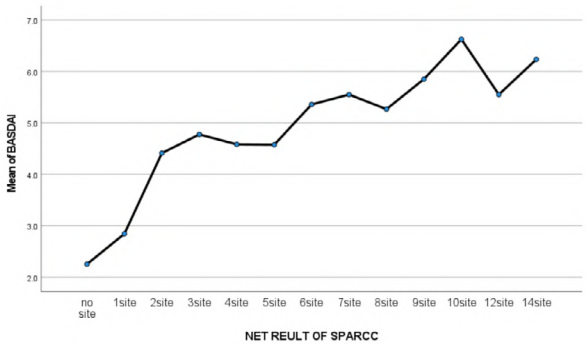
Chapter Three : Results

Figure 5 : Relation between BASDAI and SPARCC.



p-value :<0.001

Figure 6: Relation between BASFI and SPARCC

Background: Ankylosing spondylitis (AS) is a chronic, progressive inflammatory rheumatic disease involving primarily the sacroiliac joints and the axial skeleton. It is characterized by back pain and progressive stiffness of the spine. Oligoarthritis of the hips and shoulders, enthesopathy, and anterior uveitis are common, patients with AS can experience significant long-term functional impairment and disability, with reduced quality of life and an increased risk of comorbid conditions.

Aim: The aim of this study was to investigate the relationship between both enthesitis indices Maastricht ankylosing spondylitis enthesitis score (MASES) and Spondyloarthritis Research Consortium of Canada (SPARCC) with disease activity in form of clinical and laboratory parameters in Iraqi patients with ankylosing spondylitis (AS).

Methods: A total of 101 patients aged between 18_60 years old with AS were enrolled in the study, disease activity was assessed by Bath Ankylosing Spondylitis Disease Activity Index (BASDAI), functional capacity by Bath Ankylosing Spondylitis Functional Index (BASFI), and enthesitis severity by Maastricht ankylosing spondylitis enthesitis score) MASES (index and Spondyloarthritis Research Consortium of Canada)SPARCC(index. The erythrocyte sedimentation rate (ESR) and serum C-reactive protein (CRP) levels of the patients were measured in the laboratory assessments.

Results: In this cross-sectional study, we included 101 ankylosing spondylitis patients with enthesitis. The mean age of patients was 37.2±8.3 years, (83.2%) were men and (16.8%) were women. The most frequent regions of enthesitis was L5 spinous process, according to MASES and VAchilles tendons, according to SPARCC and the less frequent were LT 7th costocondral joint and RT iliac crest according to MASES and LT lateral condyle according to SPARCC. There is an important, strong positive correlation between (MASES and SPARCC) and (General assessment by patient GAP and general assessment by Doctor GAD) .There was weak positive correlation between (SPARCC and MASES) and morning stiffness.

There was no correlation found between them (SPARCC and MASES) with laboratory parameters CRP, ESR and disease duration.

Conclusion: Iraqi AS patients had relatively severe enthesitis associated with the disease activity and severe functional impairment. The evaluation of enthesitis therefore remains a reliable tool in the assessment and outcome of AS.

P580

PREVALENCE OF OSTEOPENIA AND OSTEOPOROSIS IN FEMALES OF SULAYMANIAH CITY, KURDISTAN REGION OF IRAQ

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Hawar Sardar Hassan /Afr.J.Bio.Sc. 6(13)(2024).1816-1825

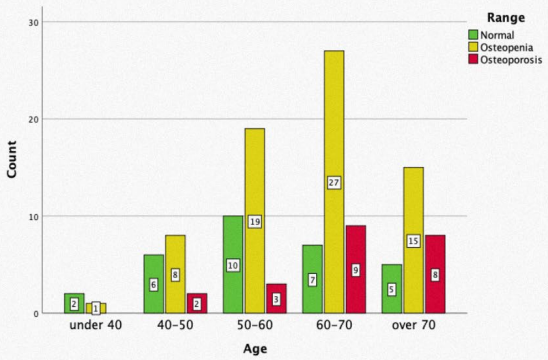
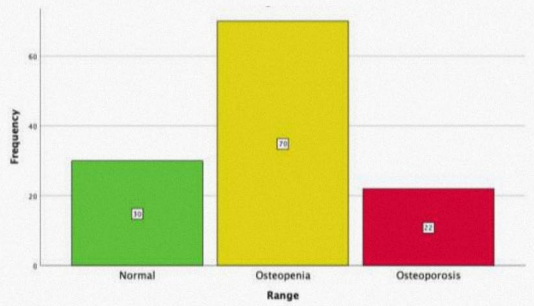


Figure No.02 Bone mineral density and T scores of patients with osteoporosis and osteopenia



In the present study, 122 females are included, out of which 57.4% are found to have osteopenia and 18% are found to have osteoporosis. From this observational study, it is found that as the age progresses the risk for osteopenia and osteoporosis increases. In women going through menopause, the prevalence of osteopenia and osteoporosis has considerably increased.

Osteopenia is a clinical term referring to the condition of decreased bone mineral density which reflects the underlying damage occurring in the microarchitecture of the bone. A specific pattern of bone mineralization is seen with respect to person's age and gender right from birth to adulthood. A few researchers proved that after the age of 30, there will be a steady and natural

loss of bone mass as the age progresses. However, the bone mineralization maintenance is determined by hereditary factors, nutritional status, body mass and hormonal environment. The present study includes the measurement of bone density of female individuals by DEXA scan. The sample size includes 122 females from Sulaymaniyah of Kurdistan region, Iraq. The bone density is determined and compared with the T-score to check the prevalence of osteoporosis and osteopenia. Thus, obtained results are statistically analyzed by using SPSS software and age-wise distribution and trend of osteopenia and osteoporosis is obtained. The present investigation showed that as age progresses the risk for osteopenia and osteoporosis increases. The incidence of osteopenia and osteoporosis has risen significantly in the females with menopause. It is evidenced from the results that the women with the age below 40 are presented with osteopenia and the women above the age of 40 with osteoporosis. The maximum number of women presented with both osteoporosis and osteopenia is seen in age group ranging from 60-70 years of age. This investigation helps the medical team to focus on therapeutic management and lifestyle changes to be followed to lessen the chances of loss of bone mass. The recommendations include correction of calcium and vitamin D deficiency, cessation of smoking and alcohol consumption, consumption of balanced diet that include dairy products and exposure to sunlight.

P581

VERTEBRAL FRACTURES IDENTIFIED BY LATERAL SPINE DXA SCANS AND MORTALITY RISK IN ADULTS

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Background

Vertebral fractures identified by radiographic morphometry are associated with increased mortality risk. However, there is scarce data regarding the association between vertebral fractures identified by lateral spine DXA scans and the mortality risk.

Methods

The present study was based on data from participants aged ≥ 40 years in the National Health and Nutrition Examination Survey (NHANES) cycle 2013-2014. Vertebral fracture assessment (VFA) was obtained during lateral spine DXA scans to provide fracture information for vertebrae T4-L4. Vertebral fracture severity was categorized according to Genant's semiquantitative technique and the NHANES 2019 public-use linked mortality files were used to determine mortality status.

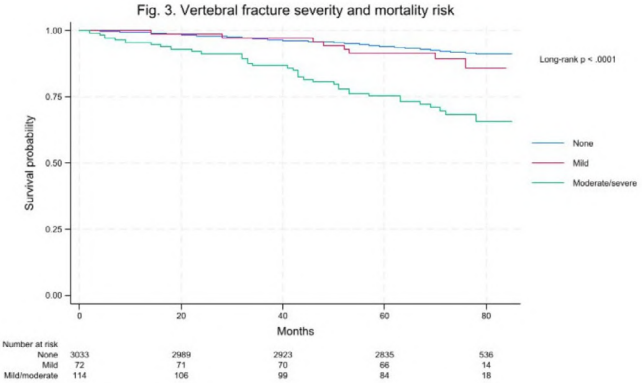
Results

Of 3,219 participants, the crude prevalence of vertebral fractures identified by VFA was 5.5% (95% CI, 4.7-6.5). During a median follow-up of 71.0 months, 277 participants died, 18.2% (95% CI, 12.2-26.3) with vertebral fractures and 6.3% (95% CI, 5.0-8.0) without fractures (p < .0001). Cox regression analysis demonstrated that participants with moderate to severe vertebral fractures (> 25% height loss) were 1.9 times more likely to die compared with their counterparts without fractures (HR, 1.95; 95% CI, 1.14-3.32). Notably, among participants with a T-score of ≤ -1, those with moderate to severe vertebral fractures had a 2-fold higher mortality risk than those who did not (HR, 2.44; 95% CI, 1.31-4.54).

Conclusions

The severity of vertebral fractures identified by VFA was associated with greater all-cause mortality risk. This association was particularly accentuated in older adults and those with low bone mass.

Fig. 3. Vertebral fracture severity and mortality risk



P582

COMPARISON OF LUMBOPELVIC ROTATION MOTION ASYMMETRY BETWEEN INDIVIDUALS WITH AND WITHOUT CROSS-LEGGED SITTING POSTURE

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Objective: This study compared the asymmetry of lumbopelvic rotation motion between individuals with and without habitual cross-legged sitting posture (CLSP), focusing on the transverse plane pelvic rotation angle (TrPRA) in the supine position, during the active straight leg raise (ASLR), and the range of motion (ROM) of active lumbopelvic rotation (ALPR).

Material and Methods: This cross-sectional study recruited 30 healthy participants, divided into a CLSP group (n = 15) and a control group (n = 15). The CLSP group consisted of individuals who sat in a knee-on-knee CLSP. A Smart KEMA motion sensor was used to measure the TrPRA in the supine position and during the ASLR. Additionally, the ROM of ALPR was measured in the side-lying position using equipment developed in the author's laboratory. Independent t-tests were used to examine group differences in the TrPRA in the supine position, the asymmetry index (AI) of the TrPRA during the ASLR, and the ROM of ALPR.

Results: In the CLSP group, the TrPRA was 1.50° ± 0.96° in the supine position, while the AI of the TrPRA during the ASLR and the ALPR ROM was 18.72% ± 12.66% and 13.21% ± 6.64%, respectively. The control group showed a TrPRA of 1.26° ± 0.94° in the supine position, an AI of 17.88% ± 14.16% for the TrPRA during the ASLR, and 7.06% ± 4.9% for the ALPR ROM. No significant differences were found in the TrPRA in the supine position or the AI of the TrPRA during the ASLR between groups (p > 0.05); however, the AI of the ALPR ROM differed significantly (p < 0.05).

Conclusion: This study found that individuals with habitual CLSP

exhibited greater lumbopelvic rotation asymmetry during active movements. Notably, a new side-lying measurement method minimized compensatory actions during ASLR, effectively revealing CLSP-related asymmetry. These findings suggest that habitual CLSP may contribute to musculoskeletal imbalances, highlighting the need for greater awareness among clinicians and individuals.

P583

IS THERE AN ASSOCIATION BETWEEN SARCOPENIA AND THE SEVERITY OF KNEE OSTEOARTHRITIS

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Objective:
To determine whether there is an association between the impact of knee osteoarthritis (OA) and sarcopenia.
Material and Methods:
Female patients with knee OA meeting the ACR criteria were enrolled. Demographic, clinical, and paraclinical data were collected. Knee osteoarthritis severity was assessed using the Kellgren and Lawrence (KL) grading system, ranging from grade 0 (no OA) to grade 4 (severe OA).
The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) was used to evaluate the impact of knee OA. It is a self-reported instrument with 24 questions, each scored from 0 to 4. Three domains are assessed: pain, stiffness and physical function. The total score ranges from 0 (normal knee) to 96 points (severe disability in daily life).
To assess sarcopenia, muscle mass was quantified using the appendicular skeletal muscle mass index (ASMI), determined via Bioelectrical Impedance Analysis (BIA) and dual-energy X-ray absorptiometry (DEXA). The ASMI was calculated by dividing the appendicular muscle mass by the square of height. Muscle strength was evaluated through a handgrip test using a dynamometer. A patient was considered sarcopenic when the ASMI was ≤ 5.5 kg/m² and grip strength was <16 kg.
Results:
A total of 31 female patients were included, with a mean age of 61±8 years [48-74]. The majority of patients (48.4%) were in stage II of the KL grading. The mean WOMAC score was 39 ±16 [11-67]. For the WOMAC, the mean pain, stiffness, physical function scores were 9±3[4-16], 2±1[0-6] and 27±12[6-48] respectively. The total WOMAC score was 39±16[11-67].
The mean handgrip strength was 11±4 kg [6 -23]. The mean ASMI was 8±1 kg/m² [5-9] measured by BIA and 7±1 kg/m² [4-9]by DEXA. Sarcopenia was detected in 9.7% (n=3) of participants.
No significant association was found between sarcopenia and the WOMAC score (p=0.4).
Conclusion:
This study found no significant association between sarcopenia and the severity or functional impact of knee osteoarthritis.

P584

EXPLORING THE ASSOCIATION BETWEEN OBESITY AND SARCOPENIA IN WOMEN WITH KNEE OSTEOARTHRITIS

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Objective:
The aim of this study was to investigate whether there is an association between obesity and sarcopenia in women with knee osteoarthritis (OA).
Material and Methods:
We included female patients with knee osteoarthritis (OA) who met the ACR criteria.
Demographic, clinical, and paraclinical data were collected.
The severity of knee OA was assessed using the Kellgren and Lawrence (KL) grading system, which ranges from grade 0 (no OA) to grade 4 (severe OA). This classification evaluates joint space narrowing, osteophytes, sclerosis, and bone deformities.
Sarcopenia was identified by evaluating muscle mass and strength. Muscle mass was measured using the appendicular skeletal muscle mass index (ASMI) through Bioelectrical Impedance Analysis (BIA) and dual-energy X-ray absorptiometry (DEXA). Muscle strength was assessed using a handgrip test with a dynamometer. The ASMI was calculated by dividing appendicular muscle mass by the square of height. Sarcopenia was diagnosed when the ASMI was ≤ 5.5 kg/m² and grip strength was <16 kg. Obesity was defined as a body mass index (BMI) ≥ 30 kg/m².
Results:
Thirty-one female patients were enrolled. The mean age was 61±8 years [48-74]. Diabetes was present in 19.4% (n=6) of participants, while 25.8% (n=8) had dyslipidemia. Eighty-point six percent had regular physical activity.
Knee OA was bilateral in 80.6% (n=25). Concerning the KL grading, the majority were classified as grade II (48.4%) or grade III (38.7%) according to the Kellgren-Lawrence (KL) grading system. The mean weight of the participants was 79.3±14 kg [42-105] with an average height of 156.4±7 cm [140-168]. The mean BMI was 32.4±5 Kg/m² [19-43] and obesity was observed in 64.5% (n=20) of patients.
Sarcopenia was observed in 9.7% (n=3). The average handgrip strength was 11±4 kg [6 -23]. The mean appendicular skeletal muscle index (ASMI) was 8±1 kg/m² [5-9] measured by BIA and 7±1 kg/m² [4-9]by DEXA.
Obesity was statistically associated with sarcopenia (p=0.014)
Conclusion:
This study showed a significant association between obesity and sarcopenia in women with knee osteoarthritis, highlighting the importance of addressing both conditions in patient management.

P585

IMPACT OF SELENIUM INTAKE ON SARCOPENIA IN FEMALE PATIENTS WITH RHEUMATOID OSTEOARTHRITIS

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Objective:
The aim of this study was to investigate whether the selenium intake is associated with sarcopenia in female patients with rheumatoid osteoarthritis (RA).
Material and Methods:
We included female patients with RA meeting the ACR criteria. Demographic, clinical and paraclinical data were collected.
A nutritional survey was conducted to estimate daily selenium intake in 40 participants, with a sufficient intake level defined as ≥ 70 µg.
Muscle mass was assessed by evaluating the appendicular skeletal mass using both Bioelectrical Impedance Analysis (BIA) and dual-energy X-ray absorptiometry (DEXA). Afterward, the appendicular skeletal muscle mass index (ASMI) was calculated by dividing appendicular muscle mass by the square of height. Muscle strength was evaluated through a handgrip test using a dynamometer.
Sarcopenia was confirmed when the ASMI was the ASMI was ≤ 5.5 kg/m² and handgrip strength was <16 kg.
Results:
Fifty-two female participants were included, with an average age of 58±8 years [40-76]. RA was
immunopositive in 92% (n=48) and erosive in 90% (n=47) of patients.
The participants had a mean disease duration of 9 ± 6 years [1-30]. Active RA with a DAS28-CRP > 3.2 was present in 90% (n=47) of patients. All of the patients had received at least one conventional treatment, and 40% (n=21) were treated with biologic therapy.
The average selenium intake in our population was 127± 54 µg [28-228] and it was insufficient in 15.4% (n=8) of patients.
The mean appendicular skeletal muscle index (ASMI) was 7.4 ± 1.5 kg/m² [5-11] by BIA and 6.5 ± 1 [4-9] kg/m² by DEXA. The mean handgrip test was 9.3 ± 5.6 kg [2-26]. Twenty percent (n=10) of participants had sarcopenia.
No significant correlation was found between daily selenium intake and sarcopenia (p = 0.182).
Conclusion:
This study found no significant association between selenium intake and sarcopenia in women with rheumatoid osteoarthritis.

P586

SHOULD THE PRESENCE OF OSTEOPOROSIS WITH KNEE OSTEOARTHRITIS INCITE THE SEARCH OF SARCOPENIA?

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Objective:
To explore a potential association between osteoporosis and sarcopenia in woman with knee osteoarthritis (OA).
Material and Methods:
Female patients with knee OA who met the ACR criteria were enrolled in this study. We collected Demographic, clinical, and paraclinical data.
Knee osteoarthritis severity was classified using the Kellgren and Lawrence (KL) scale, ranging from grade 0 (no OA) to grade 4 (severe OA), based on joint space narrowing, osteophytes, and bone changes.
Bone densitometry was conducted to diagnose osteoporosis, defined as a T-score of ≤ -2.5 standard deviations at the lumbar spine and/or femoral neck.
To detect sarcopenia, muscle strength was assessed by a handgrip test using a dynamometer. Muscle mass was evaluated through the appendicular skeletal muscle index (ASMI), calculated by dividing appendicular muscle mass by the square of height. Appendicular muscle mass was measured using both bioelectrical impedance (BIA) and dual-energy X-ray absorptiometry (DEXA). Sarcopenia was confirmed if the ASMI was ≤ 5.5 kg/m² and the grip strength was < 16 kg.
Results:
Our study was conducted on 31 female participants with an average age of 61±8 years [48-74]. Nighteen percent (n=6) had a sedentary lifestyle.
Most participants were classified as grade II (48.4%) or grade III (38.7%) based on the KL grading scale.
Osteoporosis was present in 29% (n=9) of the participants while sarcopenia was detected in 10% (n=3).
The mean handgrip strength was 11±4 kg, [6 -23]. The average ASMI was 8±1 kg/m² [5-9] when measured by BIA, and 7±1 kg/m² [4-9] when assessed by DEXA.
There was no significant correlation between osteoporosis and sarcopenia in this population (p=0.144).
Conclusion:
According to our study, there is no link between osteoporosis and sarcopenia in patients with knee osteoarthritis.

P587

SEXUAL DYSFUNCTION IN RHEUMATOLOGY: A SURVEY OF TUNISIAN PHYSICIANS' KNOWLEDGE AND PRACTICES

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Introduction :
Sexual dysfunction is a significant but often overlooked issue in the management of patients with rheumatological conditions. Despite its potential impact on quality of life, sexual health remains inadequately addressed in many clinical settings.
Objective :
This study aimed to assess the awareness and management of sexual dysfunctions among Tunisian rheumatologists and family physicians.
Methods :
A cross-sectional study was conducted among Tunisian healthcare professionals, including rheumatologists and family physicians with rheumatology training. Data were collected through a Google Forms questionnaire addressing knowledge, attitudes, and practices related to sexual dysfunction in rheumatological patients.
Results :
The study included 37 participants, comprising 29 rheumatologists and 8 family physicians. The mean age of participants was 29 [25 42] years. The mean years of practice was 4.14 [1 10] years. Among the participants, 26 were residents, 2 were specialist physicians, and 8 were hospital-university professionals.
Regarding formal training in sexual dysfunction, 29 participants (78%) reported that they had never received specific training on this topic during their medical education, while 8 (22%) had received some form of training. When asked about the adequacy of current medical education on sexual dysfunction in rheumatology, 32 participants (86%) felt that it was insufficient, while 5 (14%) believed it was adequate. Additionally, 36 participants (97%) acknowledged they lacked detailed knowledge about the effects of rheumatological treatments on sexual health, with only 1 participant (3%) feeling sufficiently informed.
In practice, the majority of participants (24, or 65%) stated they only address sexual health if the patient raises the issue first. A small number of participants (3, or 8%) regularly discuss sexual health with their patients, while 2 (5%) reported they never bring up the subject. The conditions most commonly associated with inquiries about sexual health included low back pain or sciatica (24 responses), hip pathology (16 responses), spondyloarthritis (20 responses), and rheumatoid arthritis (10 responses). Regarding when sexual health is addressed, 9 participants (24%) raised it during the initial consultation, 5 (14%) during follow-up visits, and 27 (73%) only if the patient mentions it.
Time constraints were identified as the primary barrier to discussing sexual health, with 30 participants (81%) citing this as a major challenge. Other barriers included personal discomfort (12 participants, or 32%), a lack of information about treatment options for sexual dysfunction (25 participants, or 68%), and patient reluctance or discomfort (21 participants, or 57%). When patients did raise sexual health concerns, 21 participants (57%) indicated they would explore the topic further, while 20 (54%) would refer the patient to a specialist. Regarding treatment adjustments based on sexual health concerns, 12 participants (32%) said they always adjust treatment, 19 (51%) do so occasionally, and 6 (16%) never modify treatment based on sexual health issues.
When sexual dysfunction was related to a rheumatological condition or treatment, 19 participants (51%) always referred the patient to a specialist, such as an andrologist, gynecologist, or sexologist. 16 participants (43%) referred depending on the severity of the dysfunction, while 2 (5%) never recommended specialist consultations. Regarding proactive discussions on sexual health, 20 participants (54%) agreed that it is essential to address the topic with rheumatology patients, while 17 (46%) felt it should depend on the individual patient's context.
Finally, when asked if the management of sexual dysfunction in rheumatological care should be improved, 35 participants (95%) agreed that there is significant room for improvement, while 2 participants (5%) felt that other issues should take priority over sexual health.
Conclusions :
This study highlights significant gaps in addressing sexual dysfunction among Tunisian physicians. Challenges include a lack of training, limited knowledge of treatment side effects, and barriers such as time constraints and patient discomfort. Improving education and resources, as well as adopting a more proactive approach, is crucial for better managing sexual health in rheumatology care.

P588

EXPERIENCE IN MANAGING TUBERCULOSIS IN PATIENTS WITH CHRONIC INFLAMMATORY RHEUMATIC DISEASES

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Background :
Patients with chronic inflammatory rheumatic diseases (CIRD) are at increased risk of tuberculosis , particularly when receiving immunosuppressive treatments[1]. Screening for latent TB and proper management are critical to prevent the development of active TB in this vulnerable population.
Objectives :
This study aimed to describe the clinical and therapeutic management of TB in CIRD patients.
Methods :
This was a retrospective, descriptive study conducted in a rheumatology department, including patients hospitalized between 2018 and 2024. The study focused on individuals with chronic inflammatory rheumatic diseases (CIRD), such as rheumatoid arthritis and spondyloarthritis, who had a history of tuberculosis (TB), latent TB diagnosed during pre-therapeutic screening, or ac-

tive TB during the course of CIRD treatment.

Results :

A total of 33 patients were enrolled in the study, 15 women and 20 men, with a mean age of 55.29 ± 12.9 years and a sex ratio of 0.75. Among these, 22 were diagnosed with rheumatoidarthritis (RA), and 13 had spondyloarthritis (SpA).

Regarding tuberculosis (TB) status, 15 patients had a history of TB before the diagnosis of CIRD. Specifically, 13 patients had previously experienced pulmonary TB, and two patients had ganglionic TB. Additionally, latent TB was identified in 12 patients during pre-therapeutic screening before the initiation of treatment for their chronic inflammatory rheumatic diseases (CIRD).

Eight patients (x: RA, x= SpA) had developed active TB after the diagnosis of CIRD (pulmonary TB : 4 patients, digestive TB : 2, lymphatic TB=1, multifocal TB : 1). They were all receiving disease-modifying antirheumatic drugs (DMARDs) at the time of TB diagnosis. Among them, one patient was on nonsteroidal anti-inflammatory drugs (NSAIDs), two were treated with methotrexate (MTX), and five were on biologic DMARDs (bDMARDs)(adalimumab :n=1, Certolizumab : n=1, Etanercept : n=1, Infliximab : n=2). The average duration between the initiation of methotrexate and the onset of active TB was x and it was 24.59 months [1-60] for bDMARDs. None of the patients with a history of correctly treated TB experienced reactivation of TB while receiving either cDMARDs or bDMARDs. Furthermore, patients who developed active TB under bDMARDs, did not report any history of contact with active TB, and the infectious screening conducted during the pre-therapy assessment was negative.

Patients with latent TB were all administered chemoprophylaxis, and none of these patients developed active TB during the follow-up period.

Conclusion :

This descriptive study highlights the importance of TB screening and prophylaxis in patients with CIRD, particularly those receiving immunosuppressive therapies. The findings suggest that while patients with a history of treated TB did not experience reactivation under cDMARDs or bDMARDs, careful management of latent TB with chemoprophylaxis can prevent the development of active TB. Further studies are needed to explore the long-term outcomes and best practices for TB management in CIRD patients, particularly those initiating biologic therapies.

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P589

NON-PHARMACOLOGICAL APPROACHES TO MANAGING KNEE OSTEOARTHRITIS IN PRIMARY CARE

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Introduction: Knee osteoarthritis (gonarthrosis) is a prevalent reason for consultation in primary care settings(1). Its management requires a holistic approach, combining both pharmacological and non-pharmacological strategies. This study aimed to assess the practices of primary care physicians in the non-pharmacological management of gonarthrosis.

Patients and Methods: A self-administered survey consisting of 20 questions, developed via Google Forms, was conducted among primary care physicians in Tunisia.

Results: Our study included 70 physicians (51 women and 19 men) with a mean age of 41.42 years (± 11.45) and an average of 5.63 years (± 6) of clinical practice. Regarding the non-pharmacological management of gonarthrosis, 68.6% of physicians routinely recommend lifestyle modifications, including weight loss (recommended by 70% of respondents) and physical exercise (recommended by 65%). Additionally, 20% recommended avoiding sports, and 15% suggested avoiding stairs.

Concerning assistive devices, 48.6% of physicians rarely recommended them, 30% suggested them frequently, 14.3% provided them on patient request, 1.4% prescribed them systematically, and 5.7% did not recommend them. Among those who prescribed assistive devices, the most commonly recommended were canes (40%) and unloading orthoses (35%). Soft knee braces were prescribed by 20%, orthopedic insoles by 15%, and special soft shoes with insoles by 10%. For physical therapy, 48.6% of physicians recommended it frequently, 34.3% rarely, 11.4% routinely, and 5.7% only at the patient's request.

The most commonly prescribed rehabilitation exercises included muscle strengthening and stretching (50%), aerobic exercises (30%), and joint mobilization (20%). Aquatic therapy was recommended by 10% of physicians.

With regard to sick leave, 32% of physicians prescribed it routinely during flare-ups, 14% offered it at the patient's request, 18% rarely prescribed it, and 6% never prescribed it. In terms of acupuncture, 41% of physicians had never prescribed it, 19% prescribed it rarely, 6% prescribed it often, and 1% prescribed it routinely. In 14% of cases, acupuncture was suggested by the patient.

Lastly, for spa therapy, 40% of physicians prescribed them rarely, 17% only at the patient's request, 11% frequently, and 1% routinely.

Conclusion: In this study, primary care physicians in Tunisia primarily favored lifestyle modifications and rehabilitation for the non-pharmacological management of gonarthrosis. Assistive devices and specific interventions were used less frequently. These findings highlight opportunities to improve and diversify

non-pharmacological treatment strategies for this condition in primary care settings.

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P590

EXPERIENCE OF PRIMAY CARE PHYSICIANS IN THE DIAGNOSIS OF KNEE OSTEOARTHRITIS : METHODS AND CURRENT PRACTICES

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Background: Knee osteoarthritis (gonarthrosis) represents a significant public health challenge. Primary care physicians are often involved in the management of patients with this condition, making it crucial for them to stay updated on diagnostic strategies to ensure optimal care [1].

Objectives: The aim of our study was to evaluate the level of knowledge among primary care physicians regarding the diagnostic approach to gonarthrosis.

Methods: A 19-question survey, self-administered online via Google Forms, was conducted among primary care physicians in Tunisia.

Results: Seventy physicians participated in the study, with a male-to-female ratio of 0.3. Of the participants, 81.2% were public health physicians, 15.9% were in private practice, and 2.4% were medical residents. The average age was 41.42 ± 11.45 years, with an average of 5.63 ± 6 years in practice (range: 0–35).

Among the participants, 23.5% had completed an internship in a rheumatology department, and 58.6% had attended a seminar or training on gonarthrosis.

Most participants (81.4%) considered the diagnosis of gonarthrosis to be clinico-radiological, 12.9% considered it clinical, and 7.1% considered it radiological.

In the case of non-traumatic knee pain, 30% of physicians routinely ordered radiographs, 11.4% did so for the first episode, 51.4% when the pain was unusual, and 7.1% rarely. Of those who requested radiographs, 34.8% prescribed an X-ray of the affected knee, while 65.2% ordered X-rays of both knees. In terms of radiographic views, 92.9% requested anteroposterior and lateral views, 17.1% requested a 30° femoropatellar view, and 11.4% ordered a Schuss view. In the case of normal radiographs, 34.3% of physicians requested an MRI, 25.7% sought a specialist's opinion, 14.3% ordered an ultrasound, 14.3% recommended a follow-up X-ray, and 11.4% requested a CT scan.

Regarding laboratory tests, 15.7% of physicians ordered them routinely, 47.1% frequently, 35.7% rarely, and one physician only when requested by the patient. These tests typically included an inflammatory panel (95.7%), uric acid levels (53.6%), calcium-phosphate levels (44.9%), and other tests (7.2%). In cases of knee swelling, 57.1% of physicians performed joint aspiration, 47.1% ordered an ultrasound, and 47.1% prescribed laboratory tests. Additionally, 20% referred patients to an orthopedic specialist, 25.7% to a rheumatologist, and 1.4% chose other referral options. Regarding joint aspirations, 10% of physicians performed them when necessary, while 90% did not. Among those who did not perform joint aspirations, 32.3% had not been trained in the procedure, 13.8% were uncomfortable doing so, and 32.3% believed it should be performed by a specialist. As for risk factors for gonarthrosis, 41.4% of participants systematically screened for them.

Conclusion:

Our study highlights several areas for improvement in current practices. The results suggest that many aspects of care could be enhanced, underscoring the need for better training and increased collaboration with rheumatologists to improve the management of this condition.

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THERAPEUTIC MANAGEMENT OF OSTEOPOROSIS: KNOWLEDGE AND PRACTICES AMONG PRIMARY CARE PHYSICIANS IN TUNISIA"

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Introduction although it is a public health problem, osteoporosis remains largely underdiagnosed and inadequately managed, particularly in developing countries. In Tunisia, primary care physicians play a crucial role in managing this condition.

Objective This study aims to assess the practices of primary care physicians in Tunisia regarding the management of osteoporosis.

Methods A 20-item questionnaire was distributed to primary care physicians via Google Forms.

Results A total of 59 physicians participated in the survey, consisting of eight residents, 31 general practitioners, and 17 family doctors. The sex ratio was 0.43. The mean age of participants was 39.2 ± 7.4 years. The mean number of years in practice was 13.1 ± 7.2 years.

Regarding treatment prescription, 38 (64.4%) physicians stated that they typically consult a rheumatologist before prescribing osteoporosis treatments. Seven physicians (11.9%) prescribed treatments frequently, while four did so systematically. When prescribing bisphosphonates, 13 (22%) physicians took patient preferences regarding the administration route into account, while 34 (57.6%) based their decision on the severity of Bone Mineral Density (BMD).

In cases of fracture recurrence during treatment, 36 physicians

sought specialist consultation. Other actions included investigating poor adherence (8, 13.6 %), reevaluating BMD (6, 10.2 %), or considering a treatment change (3, 5.1 %). Regarding their knowledge about the adverse effects, the most cited ones were: digestive disorders (24, 40.7%), aseptic femoral head osteonecrosis (22, 37.3 %), and renal insufficiency (14, 23.7%).
Additionally, 32 physicians (54.2%) routinely requested a medical workup before initiating treatment, and 45 (76.3%) physicians recommended lifestyle modifications, including physical activity, as part of osteoporosis management.
Conclusion: While many adhere to national and international guidelines, there are gaps in areas such as treatment adherence, management of side effects, and the pre- treatment workups.

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ASSOCIATED FACTORS WITH FIBROMYALGIA IN PATIENTS WITH DIFFICULT-TO-TREAT RHEUMATOID ARTHRITIS: A RETROSPECTIVE STUDY

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Introduction Fibromyalgia is a common comorbidity in patients with rheumatoid arthritis (RA) and significantly impacts their quality of life, exacerbating pain, fatigue, and disability. This is especially challenging in patients with difficult-to-treat (D2D) RA, as defined by the European Alliance of Associations for Rheumatology (EULAR), where the coexistence of fibromyalgia complicates disease management and therapeutic outcomes.
Objective The goal of this study was to assess the prevalence of fibromyalgia in patients with difficult-to-treat RA and identify factors associated with its occurrence.
Methods This was a retrospective study conducted within a rheumatology department, including patients diagnosed with RA who met the criteria for D2D disease according to EULAR guidelines 2020. Data were collected from medical records, focusing on patient demographics, disease duration, immunological profiles, and the presence of clinical features such as deforming RA and joint complications. The diagnosis of fibromyalgia was recorded, and potential associations with various clinical and immunological factors were explored.
Results A total of 284 patients were included in the study, consisting of 237 women (83.5%) and 47 men (16.5%), with a mean age of 60.21 ± 11.22 years and a mean disease duration of 10.65 ± 7.44 years. Regarding immunological profiles, 84.2% of patients were positive for rheumatoid factor (RF), and 67.6% tested positive for anti-CCP antibodies. At the time of diagnosis, 40.5% of the patients exhibited deforming RA. In terms of joint complications, 26 patients had unilateral coxitis, 3 had bilateral coxitis, and 29 patients presented with atlanto-axial luxation. Erosions were observed in 258 patients (90.8%). Fibromyalgia was diagnosed in 28 patients (9.9%).
In terms of immunological factors, fibromyalgia was significantly associated with the presence of rheumatoid factor (p = 0.01), while no significant relationship was found with anti-CCP antibodies. A significant association between fibromyalgia and the absence of coxitis (p = 0.04) and the absence of joint deformities at the time of diagnosis (p = 0.05). No significant association was found between fibromyalgia and the presence of atlanto-axial luxation (p = 0.4).
Conclusion Fibromyalgia is a prevalent comorbidity in patients with difficult-to-treat RA. The absence of coxitis and joint deformities at diagnosis were identified as protective factors, while the presence of rheumatoid factor was found to be a significant risk factor for the development of fibromyalgia. These results highlight the importance of considering fibromyalgia in the management of difficult-to-treat RA.

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GENOTYPE–PHENOTYPE ASSOCIATION IN A GROUP OF OSTEOGENESIS IMPERFECTA PATIENTS FROM TURKEY

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Objective: Osteogenesis imperfecta (OI) is an uncommon genetic condition affecting connective tissue, with 90% of cases resulting from dominant mutations in the COL1A1 and COL1A2 genes. The objective of this study is to evaluate the link between genotype and phenotype in a cohort of IO patients from Turkey.
Method: A total of 125 clinicaly diagnosed OI patients included in this study. Diagnosis of Osteogenesis Imperfecta based on clinical presentation by experienced endocrinologists, assessed for standing height, craniofacial, cardiac anomalies, scleral coloration, dermatological issues, and joint hyperlaxity.
Patients underwent clinical evaluation by multidisciplinary teams and were classified by three experienced doctors using the Van Dijk and Sillence criteria, specifically regarding the through clinical presentation and severity grading scale, based on clinical, radiological, and hereditary findings. The study encompasses only people with a clearly defined clinical diagnosis of Osteogenesis Imperfecta types I–IV; patients without extraskeletal involvement or with potential alternative diagnoses were excluded. All genetic analyses were conducted at the Medical Genetics units of the hospitals.
Results: The study population included 125 OI patients. There were 74 female and 51 male patients. Mean age was 33±11.3 years. Median age of first and last fracture were 4 (0-62) and 20 (6-69). Mean fracture number was 8.2±7.8. Disease severity was classified as 43 cases of type I (34.4%), 25 cases of type III (20%), and 57 cases of type IV (45.6%). As expected, our results showed blue sclera was most common in type I group but there is no significant difference between groups (p= 0.125).
Conclusion: OI types I–IV the mutation rate discovered by Sanger sequencing of collagen I was 75.2%, depending on inclusion criteria used. Genotype–phenotype analysis confirmed previous studies on severity of disease vs chain affected and mutation type.

Table 1: Clinical Characteristics of Our Patients Subdivided by OI Types

	Type I (n=43)	Type III (n=25)	Type IV (n=57)
Gender F/M	26/17	12	33/24
Familial/Sporadic Cases	17/17	6	30/22
Dentinogenesis Imperfecta n (%)	10 (24.4%)	12 (50%)	12 (25.9%)
Cardiac Defects n (%)	1 (2.5%)	2 (9.1%)	0 (0%)
Blue/Gray Sclera n (%)	34 (80.9%)	17 (70.8%)	37 (64.9%)
Wormian Bones n (%)	0 (0%)	1 (4%)	4 (7%)
Triangular Face n (%)	2 (4.7%)	3 (12%)	4 (7%)
Frontal Bossing n (%)	0 (0%)	1 (4%)	4 (7%)
Mutations n (%)			
COL1A1	33 (76.7%)	11 (44%)	35 (61%)
COL1A2	7 (16.3%)	6 (24%)	6 (10.5%)
SERPINF1	0 (0%)	0 (0%)	1 (1.8%)
P3H1	0 (0%)	1 (4%)	3 (5.3%)
FKBP10	2 (4.7%)	3 (12%)	4 (7%)
SP7	0 (0%)	1 (4%)	0 (0%)
BMP1	0 (0%)	0 (0%)	1 (1.8%)
WNT1	1 (2.3%)	0 (0%)	0 (0%)
PLOD2	3 (7%)	1 (4%)	0 (0%)
Negative for any mutation	2 (4.7%)	3 (12%)	7 (12.3%)

F: Female, M: Male, OI: Osteogenesis Imperfecta

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SEQUESTROM1 (SQSTM1) GEN MUTATIONS IN A GROUP OF PAGET PATIENTS FROM TÜRKIYE

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Objective: Paget's disease of bone (PDB) is a metabolic bone disorder that has been infrequently documented in Eastern countries. Genetic mutations in the Sequestrom1 (SQSTM1) gene have been shown to be linked to the etiology of the disease. Over 20 mutations in the SQSTM1 gene have been documented as influential in Paget's disease. The most often documented mutation occurs at position 392, resulting in the substitution of the amino acid proline with leucine. This study aims to analyze the mutation areas in a cohort of PDB patients from Türkiye, focusing on the SQSTM1 gene.
Methods: An invitation was sent to tertiary endocrinology clinics to participate in a survey regarding the demographic, clinical, radiological, and laboratory parameters associated with PDB, as well as to collect peripheral blood samples for genetic analysis. Genomic DNA was isolated from peripheral blood using the Zymo kit. Pathogenic mutations in the SOSTM1 gene were examined using the HGMD program, revealing mutations in exons 7 and 8; thus, primers were developed for these specific areas. Amplicons were examined using Next Generation Sequencing.
Results :The study included 103 patients with PDB and 50 healthy controls from 14 endocrinology centers located in 8 western cities of Turkey. This cohort of PDB (Female/Male: 53/51) had a mean age of 66.9 ± 10.5 years at diagnosis, with an illness duration of 9.5 ± 5.9 years. At diagnosis, 47.5% of the patients had symptoms. The primary clinical symptoms were bone pain and headache. Polyostotic illness was identified in 67.9% (n=70) of the patients. Bones that were frequently affected were the pelvis (43.6%) (n=45), skull (30%) (n=31), spine (29.5%) (n=30%), and femur (14.1%) (n=15).
No mutations were identified in exon 7. A heterozygous mutation was identified in 11 patients (5 females and 6 males) out of the 103 participants in the research for exon 8 (ACMG/P). A same mutation was detected in 10 individuals (P392L heterozygotes), whereas a distinct mutation was identified in one individual (M4404V heterozygotes). Among the 44 controls in the study, 43 exhibited wild type (WT) characteristics, whereas one presented a benign heterozygous polymorphism (S328S).
Conclusion: 10% of the PDB cohort from Türkiye exhibits Sequestrom1 mutations. comprehensive genetic and epigenetic investigations are essential to clarify the etiology of Paget's disease.

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THE ROLE OF VITAMIN D LEVELS IN OCCUPATIONAL HEALTH: A RETROSPECTIVE STUDY OF MEDICAL CENTER EMPLOYEES

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Objective: This study aimed to investigate changes in serum vitamin D levels between two measurements among employees of a medical center in central Taiwan and to analyze their associations with age, gender, job position, and body mass index (BMI).
Methods: A retrospective analysis was conducted on 392 employees, categorized into four groups: supervisors and physicians (n=96), nurses (n=154), administrative and medical technicians (n=97), and labor workers (n=45). Changes in vitamin D levels between two time points were analyzed, and baseline data (age, gender, BMI) were recorded. Generalized estimating equations (GEE) were used to assess the associations between vitamin D levels and related factors.
Results: The mean vitamin D levels at the first and second measurements were 22.2 ± 9.7 ng/mL and 25.4 ± 10.7 ng/mL, respectively, showing a statistically significant increase ($p<0.001$). Adjusted employees aged >50, sex, job categories, two vitamin D levels and interval measurement time, overweight or obesity had significantly lower increases in vitamin D levels compared to those with normal BMI ($p=0.002$, $p=0.042$), and overweight was a risk factor for vitamin D levels <30 ng/mL or vitamin D levels <20 ng/mL (OR=2.32, $p = 0.004$; OR = 1.92, $p = 0.004$), respectively.
Conclusion: This study demonstrated an overall increase in vitamin D levels among medical center employees, with age >50 years and normal BMI being significant factors in maintaining sufficient vitamin D levels. Future interventions should focus on overweight and obese individuals to improve their vitamin D status.
Keywords: Vitamin D、Occupational Health、Body Mass Index (BMI)

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CHARACTERISTICS AND RISK FACTORS OF VITAMIN D DEFICIENCY AMONG HOSPITAL EMPLOYEES IN DIFFERENT OCCUPATION CATEGORIES

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Objective
To investigate the prevalence and characteristics of vitamin D deficiency among hospital employees across different occupation categories and analyze the associations of demographic factors, health indicators, and seasonal variations with vitamin D status.
Methods
This retrospective study included 1,161 hospital employees who underwent their first blood tests between 2017 and 2024. Participants were divided into four occupational groups: department heads and physicians (n=314), nursing staff (n=460), administrative and medical technicians (n=282), and technical workers (n=105). Data on demographic characteristics (gender, age, BMI), health indicators (waist circumference, blood pressure, blood lipids, blood glucose), and the season of blood sampling (spring, summer, autumn, winter) were collected. Univariate and multivariate logistic regression models were applied to identify factors associated with vitamin D deficiency.
Results
The prevalence of vitamin D deficiency was 43.6%, with 37.3% of employees categorized as insufficient and only 19.1% as sufficient. Among occupational groups, technical workers had the highest deficiency rate (60.9%), while department heads and physicians had the lowest (32.4%). Female employees and younger staff (<30 years) were identified as high-risk groups (p<0.001). Higher BMI and abnormal triglycerides were significantly associated with increased risk of vitamin D deficiency (p<0.05). Seasonal analysis showed the highest deficiency rates in spring and the lowest in autumn (p=0.015). Multivariate logistic regression indicated that age ≥50 years (OR=0.50, p<0.001) and male gender (OR=0.58, p<0.001) were protective factors, while spring (OR=2.07, p=0.015) and elevated triglycerides (OR=1.003, p=0.028) were risk factors.
Conclusion
Vitamin D deficiency is highly prevalent among hospital employees, particularly in technical workers, younger staff, and females. Higher BMI, elevated triglycerides, and the spring season were identified as significant risk factors. Targeted interventions, such as vitamin D supplementation and increased outdoor activities, are recommended to improve vitamin D status and overall health, especially for high-risk groups.
Keywords
Vitamin D deficiency, hospital employees, BMI

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COMPARISON OF THE PELVIC ROTATION ANGLE DURING HIP LATERAL ROTATION IN THE STANDING AND PRONE POSITIONS IN PARTICIPANTS WITH AND WITHOUT TENSOR FASCIA LATAE SHORTNESS

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Objective: This study aimed to compare the pelvic rotation angle (PRA) during a hip lateral rotation (HLR) test in the standing position (HLRS) and the HLR in the prone position (HLRP) between individuals with and without tensor fascia latae (TFL) shortness.
Material and Methods: Thirty participants with (n = 15) and without (n = 15) TFL shortness were recruited. The PRA was measured during active HLRS and HLRP using a Polhemus Liberty electromagnetic motion tracking system. Two-way mixed analysis of variance (ANOVA) was used to identify significant differences in the PRA between groups and within positions.
Results: A significant interaction effect was identified between groups and positions on the PRA ($p < 0.05$). Individuals with TFL shortness had a significantly greater PRA during HLRS than those in the control group. The PRA during HLRS was significantly greater than that during HLRP in individuals with TFL shortness. However, no statistically significant differences in PRA were found in the prone position between groups with and without TFL shortness ($p > 0.013$). When HLRP and HLRS were performed, the PRA in the horizontal plane occurred at 1.65 ± 0.98° and 7.68 ± 4.69°, respectively, in the TFL shortness group, and at 1.27 ± 1.07° and 2.37 ± 1.96°, respectively, in the control group.
Conclusion: These results suggest that assessments should be conducted in the standing and TFL shortness may lead to increased PRA during HLRS, which can be clinically useful for confirming PRA.

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EVALUATION OF THE CLINICAL EFFECTIVENESS OF SPA TREATMENT OF PATIENTS WITH DEFORMING OSTEOARTHROSIS, GONARTHROSIS OF DIFFERENT DURATION

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Aim - To evaluate the clinical effectiveness of health resort treatment (HRT) in patients with deforming osteoarthritis, gonarthrosis (DOA) of different duration (7, 14, 18 and 21 days).
Material and methods: an open prospective randomized clinical study of 43 patients with DOA was carried out in “Gorny Vozdukh”

(Zheleznovodsk) and "Rossiya" (Yessentuki) sanatoria. Patients were divided into 4 comparable groups depending on the period of treatment (7, 14, 18, 21 days).
The assessment was made on the first and last day of HRT and included: clinical examination, testing ("Up and Go" test, the VAS questionnaire, the WOMAC scale, the Quality of Life Test questionnaire, the Hospital Anxiety and Depression Scale (HADS)).
The treatment included recommendations regarding diet and physical activity, symptomatic drug therapy, exercise therapy, a course of dosed walking along the Terrainkur routes (30-40 minutes), peloid therapy, magnetic therapy for the knee joints ("Polyus 2", Russia), laser therapy for the knee joints ("Rikta 04/4", Russia) in the amount of 6, 12, 16 and 18 procedures, respectively.
Results: In all groups of patients, regardless of the period of HRT, there was a decrease in the number of pain complaints, a decrease in the intensity of pain syndrome according to the VAS scale and an improvement in the results of the "Up and go" test. In patients with the period of HRT of 7 days the level of depression and anxiety according to the results of the HADS test decreased statistically significantly following the treatment, and the quality of life improved. In patients with the period of HRT of 14 days there was only statistically significant decrease in the level of depression. In patients with 18 and 21 days of HRT after treatment, there was an improvement in functioning on the WOMAC scale, a decrease in anxiety, depression.
Statistically significant differences were obtained between treatment periods of 7 and 18, 7 and 21 days according to the "Up and go" test, the WOMAC scale, the reduction of anxiety and depression levels and the patient's quality of life.
Conclusion: The highest clinical effectiveness of HRT is registered in patients with deforming osteoarthritis with a period of stay of 18 and 21 days.

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IMBALANCE OF LIPOPOLYSACCHARIDE-BINDING SYSTEMS AS A POTENTIAL LINK IN THE PATHOGENESIS OF RHEUMATOID ARTHRITIS

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Objective: To analyze the role of lipopolysaccharide-binding systems (LBP and BPI) in the development and maintenance of inflammation in rheumatoid arthritis (RA) and to evaluate the impact of their imbalance as a potential pathogenetic factor.
Methods: Literature review conducted using keywords "rheumatoid arthritis and lipopolysaccharide", "rheumatoid arthritis and lipopolysaccharide-binding protein", "rheumatoid arthritis and BPI" in scientific databases (e-Library, PubMed). Studies highlighting the involvement of LBP and BPI in inflammation regulation and their interplay with lipoproteins (HDL and LDL) were included.
Results: Elevated levels of circulating lipopolysaccharides (LPS) are frequently detected in RA patients. LPS interacts with a range of receptors and carrier molecules, prominently including lipopolysaccharide-binding protein (LBP) and bactericidal/permeability-increasing protein (BPI), which together form the lipopolysaccharide-binding systems. LBP primarily facilitates the transfer of LPS to CD14 and TLR4 receptors, initiating pro-inflammatory signaling pathways. In contrast, BPI exhibits strong anti-inflammatory properties by neutralizing LPS and inhibiting its interaction with cellular receptors. An imbalance between LBP and BPI levels in RA patients can shift the immune response towards persistent inflammation. Studies indicate that elevated LBP levels correlate with increased disease activity markers, such as C-reactive protein (CRP) and interleukin-6 (IL-6), while decreased BPI activity may fail to adequately counteract LPS-induced inflammation. Furthermore, dyslipidemia, a common comorbidity in RA, exacerbates the inflammatory potential of LPS. In RA patients, the altered balance between low-density lipoproteins (LDL) and HDL may contribute to a pro-inflammatory milieu, intensifying joint damage and systemic inflammation.
Conclusion: The combination of an imbalance in lipopolysaccharide-binding systems and dyslipidemia is a significant aggravating factor in RA pathogenesis. Further research into the mechanisms of LBP and BPI activity and their therapeutic modulation is a promising direction for improving RA treatment outcomes.

P600

LIPOPOLYSACCHARIDE PATHOPHYSIOLOGY IN RHEUMATOID ARTHRITIS

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Objective: Rheumatoid arthritis (RA) is by far the most prevalent autoimmune arthritis worldwide. It features progressive joint deformity, decreased quality of life and shortened lifespan. A complex array of different pathways is implicated in the onset and development of RA. Environmental triggers play especially important role in the RA pathogenesis. Lipopolysacharides (LPS) are considered to be the main environmental "culprit" of autoimmunity phenomena seen in the setting of RA. Since that it is of value to dive deeper into understanding of LPS signalling pathway and how exactly it contributes to the progression of the disease and what available treatment strategies are at our disposal to date.
Methods: According to the scope of the current article a literature narrative review has been performed. Authors have critically approached 31 literary sources.
Results: It has been shown that LPS can exert its influence via multiple ways all leading to the same much expected outcome – an increase in proinflammatory state. It includes B- and T-cell activation, synovial inflammation and subsequent gradual joint destruction, increased citrullination of both bacterial and host proteins, steering up IgM and IgG antibodies production, activation of the complement cascade. Vascular Endothelial Growth Factor (VEGF) effects and reactive oxygen species (ROS) signalling both play a

part in spiraling detrimental inflammatory changes as well. An intricate balance system helps to mitigate the intensity of LPS signalling. Its components include LPS binding protein, bactericidal/permeability-increasing protein. Certain environmental changes (smoking, "leaky gut" syndrome, nonsteroidal anti-inflammatory drugs) can cause the alterations in this self-regulating balance.
Conclusion: To date there is no formally guideline-directed treatment adressing LPS signalling specifically. Being a prolific antigen, LPS requires a deeper attention from the practical standpoint. Largely, preventive treatment strategies remain overlooked. Our position is that non-arthritis RA drugs should be implemented in the composite antirheumatic treatment.

P601

THE PATHOLOGIC «LUNG-JOINT AXIS» AS A POTENTIAL CAUSE OF OSTEONECROSIS

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Objective: The study aims to explore the mechanisms by which viral infections, particularly SARS-CoV-2, and lipopolysaccharide (LPS) contribute to the pathological "lung-joint axis" leading to osteonecrosis.
Methods: Analysis of the interactions between SARS-CoV-2, LPS, and bone tissue based on a literature review. Examination of pathophysiological changes triggered by LPS and viral infections in endothelial cells, alveolocytes, and osteocytes. Focus on the role of hypercoagulability and systemic inflammation in bone ischemia.
Results: SARS-CoV-2 directly damages alveolocytes and endothelial cells through ACE2 receptor binding and TMPRSS2-mediated mechanisms, causing increased vascular permeability and hypercoagulability. This damage reduces ACE2 activity, disrupting blood flow regulation and leading to endothelial apoptosis, as shown in autopsy studies. Simultaneously, lipopolysaccharide (LPS), a key component of gram-negative bacterial membranes, activates TLR4 receptors, stimulating pro-inflammatory cytokines such as IL-1β, IL-6, and TNF-α via the NF-κB pathway. LPS also impairs bone metabolism by increasing osteoclast activity, inhibiting osteoblast function, and inducing bone resorption. Viral infections, including SARS-CoV-2, disrupt the lung microbiome, creating dysbiosis that raises systemic LPS levels. This results in exacerbated systemic inflammation, further weakening the alveolar epithelial barrier and facilitating endotoxin translocation into the bloodstream. The combination of viral damage, hypercoagulation, and systemic endotoxemia promotes ischemic damage to bone tissue, increasing the risk of osteonecrosis. Evidence particularly highlights the role of these processes in femoral head ischemia in severe SARS-CoV-2 cases.
Conclusion: Viral infections, particularly SARS-CoV-2, and LPS significantly contribute to the pathological lung-joint axis, exacerbating systemic inflammation and hypercoagulability. This creates a favorable environment for bone ischemia and osteonecrosis. Understanding these mechanisms is critical for developing preventive and therapeutic strategies for osteonecrosis in patients with viral infections and endotoxemia.

P602

ESTIMATION OF MAIN RISK FACTORS FOR THE DEVELOPMENT OF OSTEOPOROSIS IN RHEUMATOID ARTHRITIS

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Objective: Rheumatoid arthritis (RA) as one of the most common rheumatic diseases leads to the development of secondary osteoporosis (OP), the complications of which often determine unfavorable outcomes in RA. In the pathogenesis of secondary OP, along with traditional risk factors (tRF), specific risk factors (sRF) play an important role, as well as the adverse effect of antirheumatic therapy on bone metabolism. In this regard, the assessment of the contribution of the entire spectrum of these risk factors to the development of OP in RA is of great scientific and practical importance.
Methods: The study included 124 patients diagnosed with RA (ACR/EULAR criteria, 2010). Patients were divided into 2 groups depending on the presence or absence of signs of systemic AP based on the results of clinical and instrumental examination: respectively: AP+/AP- groups. All patients underwent an analysis of clinical features of RA, as well as tFR and sFR of AP. The results were subjected to statistical analysis using the methods of variation statistics, paired correlation. The reliability of differences between the frequency of detection of RP in the observed groups was assessed using the Fisher criterion.
Results: Among 124 patients with RA included in the study, there were 96 female (77.42%) and 28 male patients. (22.58%) aged 25 to 79 years, the average age was 59.19±1.32 years, the duration of RA according to the anamnesis ranged from 3 to 28 years, the average duration of the disease was 11.41±4.09 years. In the group of RA patients we observed, the majority were over 50 years old (81.45% of the total number of patients). The clinical form of RA was characterized by polyarthritis with predominant damage to the joints of the upper extremities, with typical deformation of the hands, the presence of symptoms of morning stiffness, and symmetry of the lesion. RA activity, determined by the DAS-28 index, corresponded to a low degree (DAS-28 ≤3.2) in 19.35%, moderate (3.2> DAS-28 ≤5.1) - in 53.23% and high (DAS-28>5.1) - in 27.42% of patients. Seropositive RA was diagnosed in 65.32% of patients, 21.78% of patients had negative rheumatoid factor (RF), 12.90% were not tested for RF. Anti-cyclic citrullinated peptide (ACP) antibodies were tested in 80.64% of patients, 68% of those examined were seropositive for this marker. According to the results of standard radiography of joints and spine, ultrasound densitometry and X-ray osteodensitometry, systemic OP was diagnosed in 76 (61.28%) patients, 7 (9.21%) of whom had osteopo-

rotic fractures. Of the traditional RFs in people with RA, the most common were female gender, age > 50 years, BMI < 20 kg/m2. Of the specific RFs, the most significant were: RA duration > 5 years, activity of stage 2-3, high titer of RF and ACPA, radiographic stage > 2, long-term use of glucocorticoids. A comparative analysis of the frequency of registration of the specified tRF and sRF using the χ^2 criterion showed that it was significantly higher in the OP+ subgroup.

Conclusion: Systemic OP was diagnosed in 61.28% of RA patients. The association of OP with traditional RFs was confirmed: female gender, age over 50 years, and low body mass index. Of the disease-associated RFs, the most important were high and moderate disease activity, RA duration of more than 5 years, the presence of immunological markers in high titer, and the experience of glucocorticoid therapy. The analysis substantiates the range of preventive measures in individuals with secondary OP.

P603

EXTRACELLULAR TRAPS FORMATION BY NEUTROPHILS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Objective: Currently, the improvement of rheumatoid arthritis (RA) diagnostics is aimed at finding and validating new biomarkers, which is especially important in light of the trend towards personalized therapy of rheumatic diseases. In this study, the intensity of spontaneous and induced formation of extracellular traps by peripheral blood neutrophils in patients with RA was studied.

Methods: The study included 25 patients with a verified diagnosis of RA in accordance with the ACR/EULAR 2010 criteria and 30 healthy people. Neutrophils were isolated by one-stage centrifugation in a double Ficoll-amidotrizoate density gradient with the density of the upper and lower gradients of 1080 kg/m^3 and 1090 kg/m^3, respectively. The qualitative composition of the neutrophil fraction was assessed using microscopy of standard smears, the degree of neutrophil activation was assessed using a standard nitroblue tetrazolium test. Stimulation of the formation of neutrophil extracellular traps (NETs) was performed by incubation with phorbol-12-myristate-13-acetate. The intensity of NETs formation was recorded by fluorescence microscopy with SYBR green.

Results: At the time of inclusion in the study, the RA activity according to DAS28 was no more than 2.6 points. The average age was 51.4 ± 4.5 years, the average duration of the disease was 2.3 ± 0.8 years. Antibodies to cyclic citrullinated peptide were detected in 15 patients with RA (60%). The purity of the neutrophil fraction in RA was 93.3%, the proportion of viable cells exceeded 95%. Spontaneous NET formation was observed in the RA group and in healthy individuals. In RA patients, the incidence of spontaneous and induced NET formation was significantly higher compared to healthy individuals. The incidence of spontaneous and induced neutrophil trap formation in RA patients with high levels of anticitrulline antibodies tended to increase compared to samples from other patients.

Conclusion: Increased spontaneous and induced NET formation in RA patients allows the use of neutrophil extracellular traps as potential biomarkers of RA.

P604

EFFECT OF ENDOMETRIOSIS ON AUTOANTIBODY PROFILE IN POSTMENOPAUSAL WOMEN WITH SYSTEMIC LUPUS ERYTHEMATOSUS

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An increased risk of comorbid autoimmune diseases in endometriosis, such as systemic lupus erythematosus (SLE), has been determined in women of reproductive age and hardly considered after menopause.

Purpose of the study:

Study of autoantibody profile features in patients with SLE depending on the presence of endometriosis.

Materials and Methods.

Fifty-three postmenopausal patients with SLE (17 of them with endometriosis) were included in the study. The diagnosis of endometriosis was established on the basis of physical examination of the patients by a gynecologist and was confirmed by instrumental methodsLaboratory examination included a panel of autoantibodies established as part of the diagnostic criteria for SLE: determination of antinuclear antibodies (ANA) by indirect immunofluorescence antibody test on HEp-2 cell substrate (diagnostic titer ≥ 1: 80), antibodies to double-stranded DNA (anti-DNA), Smith antigen (anti-Sm), cardiolipin (aCL-IgG and aCL-IgM), β2-glycoprotein-I (anti-GP-I) using appropriate enzyme immunoassay kits.

Results and Discussion.

A higher proportion of patients with positive ANA titers (≥ 1:80) was found in the group of SLE patients with endometriosis ($p = 0.034$). Levels of anti-DNA and anti-Sm were more often higher in SLE patients with endometriosis, but the differences did not reach statistical significance ($p = 0.069$ and $p = 0.08$, respectively). Similarly, no intergroup differences were observed for antibodies to cardiolipin of different classes and anti-GP-I ($p > 0.05$).

Determination of ANA by indirect immunofluorescence antibody test on HEp-2 cells also allowed characterizing the types of nucleus staining: homogeneous (45.3%) and granular (41.5%) types of nuclei luminescence were determined most frequently. Antibody titers of 1:320 or higher were detected in a significant percentage of ANA-positive patients in the group of SLE patients with endometriosis. Presumably, higher titers of SLE-specific autoantibodies may be associated with the risk of more severe stages of endometriosis.

Conclusions.

ANA are frequent serologic manifestations in patients with SLE and occur in endometriosis. The marked ANA positivity in patients

with SLE in the presence of endometriosis reflects the similarity of the underlying humoral immune dysfunction in these diseases.

P605

A TECHNICAL NOTE ON THE MODIFICATION OF INTRAMEDULLARY NAILING TECHNIQUE FOR BASICERVICAL HIP FRACTURES USING A CANNULATED SCREW TO PREVENT ROTATION

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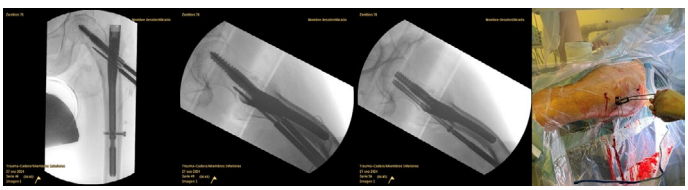
Background: Basicervical fractures of the hip present a unique challenge due to their transitional location between the femoral neck and intertrochanteric region, often leading to a higher rate of fixation failure. Current treatment commonly involves the use of intramedullary nails. However, rotational instability remains a significant issue. We present a technical modification designed to address this limitation by incorporating an additional cannulated screw to enhance rotational stability.
Methods: We utilized the ZNN Bactiguard nail (Zimmer) in combination with a 7.3 mm diameter cannulated screw. After positioning the intramedullary nail and its proximal screw, a Kirschner wire was inserted through the proximal screw of the nail. Using a parallel wire guide, a second Kirschner wire was introduced parallel to the proximal screw. The 7.3 mm cannulated screw was then inserted over this wire to act as an additional rotational stabilizer.
Results: We have employed this surgical technique in numerous patients, successfully avoiding cut-out (Aguado-Maestro I, Escudero-Marcos R, Nistal-Rodríguez J, et al. *Hip fractures with rotational instability: concept and surgical technique.*Surgery Curr Res. 2013). The novelty of this technique lies in the use of the parallel wire guide, which facilitates the precise placement of the cannulated screw and enhances the overall rotational stability of the construct.
Conclusion: The addition of a 7.3 mm cannulated screw, using a parallel wire guide, provides a simple yet effective solution to the problem of rotational instability in basicervical hip fractures treated with intramedullary nailing. This technique offers potential for improved outcomes and may reduce the incidence of fixation failure.



P606

LONG-TERM ASSESSMENT OF OSTEOARTHRITIS AND ANKLE INSTABILITY IN PATIENTS TREATED WITH CASTAING TECHNIQUE: A RETROSPECTIVE ANALYSIS

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Objective: The aim of this study is to evaluate the clinical and radiological outcomes of patients treated for chronic ankle instability using the non-anatomic Castaing plasty technique.
Material and Methods: This study included patients who had undergone the Castaing procedure and consented to participate. Clinical evaluation was based on the Visual Analog Scale (VAS) for pain and the Cumberland Ankle Instability Tool (CAIT). Physical examination assessed joint stability and range of motion, while weight-bearing radiographs were used to classify osteoarthritis using the Van Dijk system. Statistical analysis was conducted using SPSS 20.0, with significant p-values set at <0.05.
Results: 20 patients were included, with a follow-up ranging from 3 to 32 years. Of these, 90% reported a pain score of 0 on the VAS. The median stability score on the CAIT was 83.5%, with 80% of patients scoring above 70%. Two patients experienced discomfort at the fibula or base of the 5th metatarsal, but all patients demonstrated stable ankles, with 100% showing no anterior drawer or varus instability. However, 64.7% of patients exhibited reduced mobility compared to the contralateral side, and one patient had weakened eversion. Radiological findings showed that 30% (6 patients) experienced a one-grade progression in osteoarthritis, with three progressing from mild to moderate and one from moderate to severe. The median age of these patients was 54 years, with a median follow-up of 16 years. Statistically significant differences were noted in osteoarthritis progression (p=0.014), although this did not correlate with clinical outcomes, as all patients with osteoarthritis changes reported a VAS pain score of 0 and a median CAIT score of 88.5%.
Conclusions: Patients treated with the Castaing technique for ankle instability demonstrate satisfactory long-term stability, with excellent pain relief on the VAS. Radiological progression of osteoarthritis was observed in 30% of patients, though this did not result in clinically significant symptoms. The procedure offers reliable long-term outcomes with minimal complications.

P607

MANAGEMENT OF PERIPROSTHETIC HUMERAL FRACTURES IN THE ELDERLY

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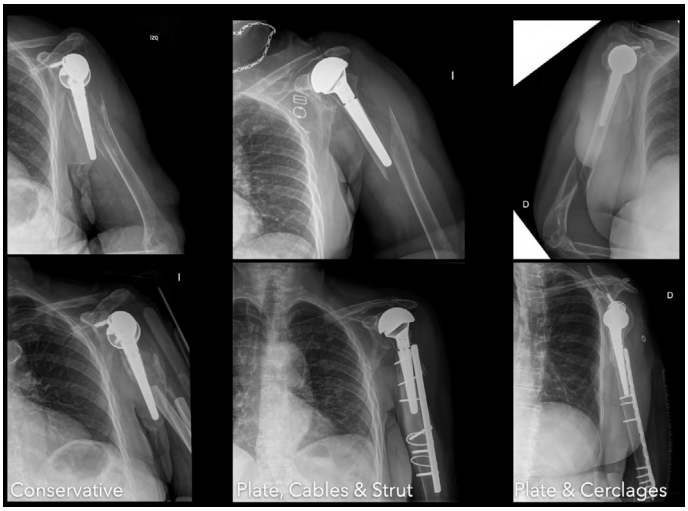
Introduction Periprosthetic humeral fractures in elderly patients present significant challenges due to poor bone quality and co-morbidities. This case series reports the management of such fractures, focusing on three different treatment approaches and their outcomes.

Methods We present a series of cases involving elderly patients with periprosthetic humeral fractures, managed using the following approaches:

- Conservative Management: Selected for frail patients with high anesthetic risk. Despite its necessity in this group, fracture non-union was observed, and no consolidation was achieved.
- Open Reduction and Internal Fixation (ORIF) with Plate, Cerclage, and Cortical Strut Allografts: Applied to fractures at the tip of the prosthesis, combining plate fixation, cerclage wiring, and cortical strut allografts to enhance stability.
- ORIF with Posterolateral Humeral Plate and Cerclage: Used for fractures distal to the prosthesis, with posterolateral plating and cerclage providing robust fixation.

Results Conservative treatment failed to achieve fracture consolidation, leading to poor functional outcomes. Both surgical methods demonstrated successful bone healing and better functional recovery. Cortical strut allografts provided essential support in fractures at the prosthesis tip, while posterolateral plating for distal fractures ensured stable fixation. The most commonly observed complication was transient radial nerve palsy, which resolved spontaneously in all cases.

Conclusion Surgical management, either with cortical struts or posterolateral plating, achieved favorable outcomes in elderly patients with periprosthetic humeral fractures, in contrast to the poor results of conservative treatment, which failed to promote fracture healing. Transient radial nerve palsy was the most frequent complication but resolved in all cases. Surgical intervention should be prioritized when patient conditions allow.



P608

POSTERIOR QUADRATUS LUMBORUM BLOCK AS A TREATMENT FOR CHRONIC HIP PAIN IN OSTEOARTHRITIS PATIENTS

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Background: Hip osteoarthritis is a prevalent condition that significantly affects morbidity and quality of life. Effective management of chronic hip pain necessitates a multimodal approach to enhance joint function and overall well-being. This study aimed to evaluate whether the posterior quadratus lumborum block (PQLB) could reduce pain and improve quality of life in patients suffering from chronic hip pain.

Methods: Following Ethics Committee approval (No. PI 21-PI104 on June 26, 2021) and registration (ClinicalTrials registration number: NCT04438265), we conducted a prospective cohort study. A total of 200 patients with chronic hip pain unresponsive to previous treatments were enrolled, divided into two groups of 100 each. The intervention group received the PQLB as an analgesic technique, while the control group did not. The PQLB was performed under ultrasound guidance with the patient in the lateral decubitus position. After identifying the quadratus lumborum muscle, 15 ml of levobupivacaine 0.25% with 8 mg of dexamethasone was injected into the fascial space. Patients were discharged 30 minutes post-block. Pain levels were measured using the Numeric Pain Rating Scale (NRS), and quality of life was assessed using the Western Ontario and McMaster Universities Osteoarthritis Index Questionnaire (WOMAC) at 3 weeks and 3 months post-intervention.

Results: Demographic data showed no significant differences between the groups. Pain and quality of life scores improved significantly at the third visit for the PQLB group (NRS mean values from 7.28 to 4.79; WOMAC mean values from 54.31 to 35; p=0.001). In contrast, the control group maintained their baseline scores (NRS

7.69/8.07 and WOMAC 61.10/61.3). Notably, 40 patients in the PQLB group exhibited improvements in NRS and WOMAC scores exceeding 50% by the third month, with ten patients reporting sustained improvement over one year post-block. Patients with avascular necrosis experienced less improvement overall. Only two adverse events were recorded.

Conclusions:

Our findings suggest that the posterior quadratus lumborum block could be a minimally invasive option for managing chronic hip pain, leading to significant reductions in pain and enhancements in quality of life.

P609

ARE THERE NEGATIVE PREDICTIVE FACTORS FOR THE OUTCOMES OF LUMBAR FACET INJECTIONS?

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Objective: To identify predictive factors for negative outcomes following lumbar facet joint injections.

Materials and Methods: All patients who presented with low back pain over a two-month period completed various questionnaires: the Numerical Rating Scale (NRS) for pain, Oswestry Disability Index (ODI), SF-12 Health Survey, Pain Catastrophizing Scale, Fear-Avoidance Beliefs Questionnaire (FABQ), and Neck Disability Index (NDI). Additional data collected included body mass index (BMI), physical activity levels, employment status, and recommended treatments. A descriptive analysis was conducted on the data from patients who underwent lumbar facet joint injections.

Results: A total of 160 patients attended the consultation and completed all the questionnaires, with a mean age of 54.7 years (range 18-89), 60.6% being women, and a BMI of 18.2 or higher (24.4% had a BMI of 21.3). Of these, 51.3% engaged in sports activities, and 62.5% were employed. The scores recorded were: NRS for the spine 7 [5-8], NRS for the leg 5 [0-7], and Oswestry 22 [13.3-36].

Out of the 160 patients, 36 were recommended for lumbar facet injections, 26 underwent the procedure, and 21 reported outcomes. Of these, 17 showed a positive response (improvement within the first two hours), while 4 reported no improvement, indicating a negative outcome. Patients with negative outcomes had a mean age of 63.3 years and a BMI over 20.3 (46.2% had a BMI between 26.7 and 33.1). Additionally, 53.8% of these patients did not engage in sports, and 50% were employed.

Patients with negative outcomes had higher scores on the NRS for leg pain, Oswestry Disability Index, SF-12 Physical Component Summary, and FABQ. Their scores on the Pain Catastrophizing Scale were similar to those with positive outcomes.

Conclusions: Patients recommended for lumbar facet injections tend to be older, have a higher BMI, lead a more sedentary lifestyle, and have lower employment rates. Those with negative outcomes following the injection appeared to have greater daily limitations due to low back pain and engaged more in avoidance behaviors due to fear of pain onset.

P610

PREDICTORS OF RECOVERY AND MORTALITY IN MEN FOLLOWING FRAGILITY HIP FRACTURES: A SINGLE-CENTER OBSERVATIONAL STUDY

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Objective: To investigate the impact of sociodemographic and clinical characteristics on recovery and mortality outcomes in men following fragility hip fractures (FHF).

Methods: Retrospective single-center study including men aged 50 years or older, referred to a Fracture Liaison Service during their hospitalization in the orthopedics department due to FHF, between October 2022 and October 2024, registered in Reuma.pt. Sociodemographic, clinical and outcome data were collected. Recovery was defined as a return to the level of dependency prior to the event according to the Elderly Mobility Scale. Univariate analyses and binary logistic regression were performed to evaluate predictors of recovery and mortality at 12 months after the FHF, adjusting for age. A p-value ≤ 0.05 was considered statistically significant.

Results: A total of 82 patients were included, with a mean age of 78.04±10.69 years. Of these, 39 patients fully recovered and 21 patients died within 12 months after the FHF. Patients who recovered were younger (p=0.023), had shorter hospital stays (p=0.016), were more likely to engage in regular physical exercise (p=0.007) and adhere to a rehabilitation program (p=0.018), and were less likely to have cardiovascular diseases (p=0.018) and dementia (p=0.029). Cardiovascular diseases (p=0.001), polypharmacy (p=0.014), the use of fall-risk-increasing drugs (p=0.021) and non-adherence to a rehabilitation program (p=0.001) were associated with mortality.

Binary logistic regression analyses identified regular physical exercise as an independent predictor of recovery: patients who engaged in regular physical exercise had a 5.34-fold higher likelihood of recovery (OR=5.34; 95%CI: 1.28–22.19; p=0.021). Longer hospital stays were significantly associated with reduced odds of recovery, with each additional day of hospitalization decreasing the odds by 8% (OR=0.92; 95%CI: 0.87–0.98; p=0.012). Adherence to a rehabilitation program after discharge was associated with an 82% lower risk of mortality (OR=0.18; 95%CI: 0.04–0.87; p=0.033).

Conclusions: Regular physical exercise and hospitalization length were independent predictors of recovery, whereas adherence to a rehabilitation program after discharge independently predicted reduced mortality 12 months after the FHF.

P611

FEATURES OF THE ORGANIC AND FUNCTIONAL PATHOLOGY OF THE THYROID GLAND IN PATIENTS WITH PRIMARY OSTEOARTHRITIS

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Objective. The aim of the study was to assess the frequency and nature of organic and functional thyroid pathology in patients with primary osteoarthritis (OA), as well as to identify the features of the course of the joint process depending on the state of thyroid status.

Methods. 295 people were examined, 90 of them were patients with a clinically manifest form of primary OA (the main group) and 205 practically healthy residents of Chuvashia (the control group). All patients with OA underwent comprehensive clinical, laboratory and X-ray examination of the joints. The thyroid echostructure and volume were evaluated in patients with OA and in the control group, and the blood levels of thyroid-stimulating hormone (TSH), free fractions of thyroxine (T4) and triiodothyronine (T3) were determined by enzyme immunoassay. The Statistica 10.0 program was used for statistical processing of the obtained data. The threshold level of statistical significance was p=0.05.

Results. The frequency of organic thyropathies in the two compared groups was approximately at the same level. At the same time, it turned out that among the organic thyroid lesions in patients with OA, nodular euthyroid goiter prevails (20.0±4.2%), the prevalence of which is 2.5 times (px2=0.003) higher than the population level (8.1±2.2%). In the control group, organic thyroid diseases were represented by diffuse euthyroid goiter by more than 70%.In patients with OA, increased risk factors for the development of nodular euthyroid goiter were identified: female, age over 50 years, damage to the distal interphalangeal joints of the hands with the formation of Heberden nodules, the presence of pronounced radiological changes in the joints.

The results of the study indicated a more unfavorable course of OA in individuals with organic thyroid pathology. They showed higher values of joint indices, had more intense joint pain during exercise, assessed on a visual analog scale (p=0.007), significantly higher was the total value of the algofunctional index of severity of Leken's gonarthrosis (p=0.043) and a significant deterioration in quality of life (p=0.006) in comparison with patients with OA without organic thyroid pathology. Patients with OA with organic thyroid lesions were significantly more likely (p<0.031) to have X-ray stages III and IV of gonarthrosis (according to Kellgren and Lawrence).

When comparing the concentration of thyroid hormones in the blood of patients with OA (without structural changes in the thyroid gland) and those in the control group, statistically significant decreases in the average levels of T3 (1.9±0.1 versus 2.7±0.2 nmol/l, p=0.007) and TSH (0.9±0.1 versus 1.6±0.3 mIU/l, p=0.023). A thorough analysis of the hormonal spectrum in patients with OA allowed us to conclude that the so-called "euthyroid pathology syndrome" (SEP) is highly prevalent among this category of patients. This condition was diagnosed in 42.9% of patients with OA without thyroid pathology. SEP was represented mainly by two variants: a "low" level of T3 (37.5%) and "anomalies" (decrease in level) TSH (58.3%). The development of "low" T3 syndrome was more often observed in OA patients with more pronounced pain syndrome and manifestations of reactive synovitis.

Against the background of symptomatic therapy aimed at reducing the severity of pain and reactive synovitis, the thyroid status in patients with OA with organic thyroid pathology did not undergo significant dynamics, whereas in patients with functional abnormalities in the thyroid axis it underwent positive changes, which were expressed in an increase in initially low levels of T3 and TSH.

Conclusion. Thus, patients with primary OA were more likely than the general population to have both organic (predominantly nodular euthyroid goiter) and functional (SEP variants with "low" T3 levels and "TSH abnormalities") thyroid pathology. Patients with organic thyroid pathology had more pronounced clinical and radiological manifestations of joint syndrome. In patients with SEP, additional therapeutic measures aimed at correcting thyroid status abnormalities were not required. Therapy aimed at reducing the severity of pain syndrome and relieving reactive synovitis provided positive changes in thyroid status, which were expressed in an increase in initially low T3 and TSH.

P612

STATE OF BONE MINERAL DENSITY IN PATIENTS WITH JOINT AND SPINE LESIONS DUE TO OCHRONOSIS

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Introduction. Ochronosis is a rare metabolic disease resulting from a gene mutation that leads to the accumulation of homogentisic acid in the body, which under the influence of tyrosinase is converted into alkapton, which is partially excreted by the kidneys and deposited in cartilage and connective tissue to a greater extent. In the late stage of the disease, the latter inevitably leads to marked degenerative arthropathy and vertebral lesions. There is progressive calcification of intervertebral discs with fusion of neighbouring vertebral bodies, formation of spondylophytes and calcification of intervertebral ligaments. It has been shown that ochronosis has a higher rate of bone resorption, which in turn can lead to rapid loss of bone mass and the development of osteoporosis.

The aim of the study was to evaluate the state of cartilage tissue and bone mineral density (BMD) of the central skeleton in patients with late-stage ochronosis.

Methods. The study included 6 patients (2 of them men) aged

53-64 years (median (Me) age - 60 years) with a verified diagnosis of ochronosis with joint and spine lesions. All patients were assessed for axial skeletal BMD using a Lunar X-ray osteodensitometer.

Results. All patients clearly showed the stage of appearance of all the main signs of the disease: from early childhood - alkaptonuria, at the age of 34 [30; 50] years (hereinafter Me and interquartile range - Me [Q1; Q3]) - pigmentation of the auricles and sclera, ochronotic spondylo- and arthropathy - at 38.5 [22; 50] and 42 [30; 52] years respectively. However, the diagnosis of 'ochronosis' was established on average 23 years after the clinical manifestation of the disease, all these years the patients were observed with the diagnoses of 'ankylosing spondylitis'/'spondylopathy' and 'osteoarthritis'. The qualitative test for alkaptonuria was positive in all patients.

Periodic pain and stiffness in the lumbar spine with subsequent involvement of the thoracic spine, mechanical back pain, calcification of intervertebral discs, calcification of the anterior longitudinal and lateral ligaments of the spine, and fusion of vertebral bodies were observed on radiographs. The latter two features resembled the changes in the spine occurring in the late stage of ankylosing spondylitis.

Persistent reactive synovitis of the knee joint was found in 3 cases. The lesions of the hip and knee joints were more often asymmetrical. Aseptic necrosis of the femoral head developed in 3 cases (women). Due to the development of secondary gonarthrosis and coxarthrosis, 5 patients underwent consecutive endoprosthesis of large joints of the lower limbs: 3 joints (3 patients) and 2 joints (2 patients) with restoration of the limb axis and joint function. 1 patient is scheduled to undergo knee arthroplasty in 2025. It is noteworthy that the development of osteoarthritis was rapidly progressive - implantation of the first endoprosthesis was performed within 4 to 7 years from the moment of clinical manifestation of arthropathy. Intraoperatively, black pigment deposits were detected in the subchondral bone; articular cartilage was thinning, and in some places it was absent. Cement fixation of the respective endoprosthesis components was performed in all cases.

Dual-energy X-ray absorptiometry of the central skeletal regions revealed a significant decrease in BMD in the proximal femur (T-criterion averaged -2.5 [-2.5; -1.5] SD) with no changes in BMD in the lumbar spine (T-criterion -0.7 [-1.1; 0.6] SD). The results of osteodensitometry in 3 patients were consistent with osteoporosis and in 3 cases with osteopenia. A 53-year-old man had a history of a low-energy femoral fracture sustained a year earlier. A 59-year-old woman had pathological fractures of distal forearm bones on both sides. All patients were recommended bisphosphonate therapy, two of them - for prophylactic purposes. One year later, a slight increase in BMD was observed in the lumbar vertebrae (by 3.4% on average) and the proximal femur (by 2.3% on average).

Conclusions. In patients with ochronosis, rapid development of secondary osteoarthritis of weight-bearing joints was observed, which led to implantation of the first endoprosthesis within 4 to 7 years from the moment of clinical manifestation of arthropathy. A total of 5 patients have now undergone 13 total major joint endoprosthetics. Our results show increased bone resorption, with a marked discrepancy between the BMD values of the proximal femur (consistent with osteoporosis or osteopenia) and lumbar vertebrae (leading to falsely elevated results, probably due to extensive calcification of the intervertebral discs and degenerative spinal lesions). One-third of cases had a history of previous low-energy bone fractures. In patients with ochronosis, periodic assessment of proximal femoral BMD should be performed from a young age to plan prophylactic anti-osteoporotic therapy.

P613

CHONDROCALCINOSIS IN PATIENTS WITH HEREDITARY HEMOCHROMATOSIS

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Objectives Hereditary hemochromatosis (HH) is a common autosomal recessive disorder, particularly prevalent in Caucasian populations. It is characterized by iron overload affecting various organs. Chondrocalcinosis (CC) is a frequent feature of HH-associated arthropathy. This study aimed to investigate the radiological features of CC, including crowned dens syndrome (CDS), in patients with HH.

Materials and Methods This retrospective study analysed data collected between January 1, 2008, and December 31, 2023, from Riga East Clinical University Hospital and the outpatient clinic ORTO.

Results The study included 69 patients with HH, with a mean age of 49.1 ± 14.4 years; 55.1% of the cohort were female. The mean ferritin level and transferrin saturation coefficient (TSAT) at diagnosis were 810.3 ± 844.0 ng/mL and 67.0% ± 22.5%, respectively. Conventional knee X-rays were performed in 22 (31.9%) patients, revealing CC in 4 (18.2%) patients aged 63-76 years. Additionally, 3 out of 4 patients were female. No statistically significant differences were found in ferritin levels or TSAT between patients with and without CC. Interestingly, a higher proportion of patients with CC reported fatigue compared to those without CC, but the association between symptoms (joint pain and fatigue) and CC findings was not statistically significant. In addition, 26 patients (37.7%) underwent CT head scans for various clinical indications. Among them, 3 patients (11.5%), aged 65-73 years, exhibited typical radiographic findings of periodontal calcification, known as crowned dens syndrome. For two patients these changes were seen 5 years before and for one patient – 3 years after the HH diagnosis. Ferritin levels and TSAT did not differ significantly between patients with and without CDS findings on head CT scans.

Conclusions Arthropathy is a common feature of HH and may present as the initial manifestation of the disease. This condition can be severe and disabling, yet its pathogenesis remains poorly understood. The clinical implications and long-term consequences of HH-associated arthropathy are not fully comprehended. Future studies should prioritize exploring the pathogenesis and

progression of HH arthropathy to identify potential therapeutic targets.

P614

FREQUENCY OF TIBIA FRACTURES IN PERSONS OVER 40 YEARS OF AGE IN THE REPUBLIC OF CRIMEA

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Objective: to study the incidence of tibia fractures in individuals over 40 years of age in the Republic of Crimea. Materials and methods: medical records of trauma centers and trauma departments with a stable population, where primary morbidity was recorded, were analyzed. Only fractures resulting from low-level trauma were assessed. A specially developed questionnaire with verification of patients in alphabetical order was filled out. The incidence of fractures was calculated by 5-year strata and per 100,000 person-years of observation. Results: the population over 40 years of age was 68,133 for women and 43,470 for men. In women, the incidence of tibia fractures ranged from 110.1/100 thousand person-years at the age of over 70 years to 207.8/100 thousand person-years in the age group 50-54 years, averaging 146.0/100 thousand person-years of observation. In men, the highest incidence was found at the age of 45-49 years 145.1/100 thousand person-years and in the age group over 70 years - 141.5/100 thousand person-years. The lowest rates were in the age groups 60-64 years 101.7/100 thousand and 65-69 years – 103.0/100 thousand. The average rate of tibia fractures in men was 126.5/100 thousand person-years of observation and was lower than in women. Conclusions: in women, the frequency of tibia fractures was higher than in men and there are differences in fracture rates by age groups depending on gender.

P615

LOW-ENERGY FRACTURES IN PATIENTS WITH RHEUMATOID ARTHRITIS: A PROSPECTIVE OBSERVATIONAL STUDY

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Objective. To determine the frequency and risk factors of low-energy fractures in patients with RA that occurred during long-term prospective observation. Material and methods. The study included 103 women with RA (ACR/EULAR2010). The average follow-up period was 8.45±1.34 years, the average age was 63.5±8.13 years, the average duration of RA was 22.8±9.50. All patients underwent a clinical examination with anamnestic data assessment, radiography of the thoracic and lumbar spine, dual-energy X-ray absorptiometry of the lumbar spine and femoral neck. Vertebral fracture was determined by a semi-quantitative method when detecting deformity of grade I and higher. Radiographs of the hands and feet of 85 patients were assessed using the Sharp van der Heijde method at baseline and over time. Results. During the observation period, the number of patients with fractures increased from 36 (35%) to 60 (58%), 43 (42%) patients had one or more low-energy fractures during the observation period, including 19 (44%) patients with a history of low-energy fracture and 24 (56%) patients with their first fracture. Two or more fractures during the observation period were experienced by 9 (9%) patients. A total of 55 fractures occurred during the observation period, of which 27 (49%) were vertebral and 28 (51%) were peripheral. We divided the patients into two groups: Group I - 43 patients "with fractures", Group II - 60 patients "without fractures" that occurred during the observation period. 43 (100%) patients in Group I and 53 (90%) patients in Group II were in menopause (p=0.032). The mean age, disease duration, RA activity (DAS28), and HAQ did not differ significantly. At baseline, there were more patients in Group I receiving GC (p=0.002), including those taking GC for a long time (more than 3 months) (p=0.011). The baseline erosion score (p=0.053), joint space narrowing score (p=0.044), and total Sharp van der Heijde score (0.031) were significantly higher in Group I. Long-term GC use (p=0.011), menopause (p=0.032), and erosion score (p=0.053) were defined as a set of factors associated with low-energy fractures. The sensitivity/specificity of the model is 83%/55%, respectively. Conclusion. During the observation period, the number of patients with fractures increased by 23%. In women with long-standing RA, 42% developed a fragility fracture during an eight-year follow-up period. Risk factors for fractures included long-term GC therapy, high Sharp van der Heijde erosion score, and menopause.

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ASPECTS OF DISABILITY FORMATION IN PATIENTS WITH DYSFUNCTIONS OF THE PELVIC ORGANS CAUSED BY SPINAL CANAL STENOSIS, INJURIES OF THE THORACIC AND LUMBOSACRAL SPINE

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Objective. To analyze the factors causing disability in patients with dysfunction of the pelvic organs caused by spinal canal stenosis, injuries of the thoracic and lumbosacral spine.

Material and methods. The study included 73 patients with dysfunction of the pelvic organs due to spinal stenosis and spinal cord injury of the thoracic and lumbosacral spine.

During the study, an assessment was made of the rehabilitation potential and prognosis, categories of impairments, and limitations of life activity in interaction with environmental factors, which made it possible to identify the main criteria for the risk of disability and its severity.

Results. The risk of disability in patients with dysfunction of the pelvic organs is determined by the influence of several factors related both directly to the clinical manifestations of the disease and its consequences, and to the clinical and labor prognosis.

Conclusion. The result of the study was a diagnostic algorithm for determining the presence and severity of dysfunction of the pelvic organs in patients with spinal stenosis, injuries of the thoracic and lumbosacral spine for use in the practice of medical and social examination.

P617

FOOT DEFORMITIES IN ELDERLY : WHAT ARE THE PREDICTORS OF FALLS?

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Background: Falls are common among older adults, both in community settings and care homes. Several risk factors have been suggested, including foot abnormalities.
Objective: To assess the impact of foot deformities on fall risk among elderly
Methods: A cross-sectional comparative study was conducted. Patients older than 60 years, able to walk independently, and without cognitive impairment were included. Participants' foot and ankle characteristics were assessed across four specific domains: foot deformities and skin lesions, range of motion (ROM), foot sensation, and foot pain. The evaluation of foot deformities included the presence and severity of hallux valgus (measured using the Manchester scale) and other toe deformities. Foot pain and its impact on functionality were assessed using the Manchester Foot Pain and Disability Index (MFPDI). Participants were categorized into two groups: 'fallers' and 'non-fallers,' based on their fall history over the past 12 months. Both univariate and multivariate analyses were performed, with a significance level set at $p < 0.05$ for all tests.
Results: Ninety-six participants were included in the study (mean age = 67.20 ± 5.54 years; sex ratio = 0.15). Among them, 42 participants (43.8%) reported at least one fall in the past year. Fallers demonstrated a significantly higher prevalence of foot deformities (53.9% vs. 46.1%, p<0.0001), including more severe hallux valgus (56.3% vs. 43.8%, p=0.026), increased plantar fat pad atrophy (67.3% vs. 32.7%, p<0.0001), and a greater incidence of intertrigo (86.7% vs. 13.3%, p<0.0001). Additionally, fallers exhibited significantly reduced tactile sensitivity (60.9% vs. 39.1%, p=0.05), reported more severe foot pain (MFPDI = 9.71 ± 4.198 vs. 5.72 ± 2.811, p=0.001), had a higher prevalence of pes planus (54% vs. 46%, p=0.035), and showed significantly decreased ankle dorsiflexion (68.8% vs. 31.3%, p=0.027). However, no significant differences were observed between the groups regarding the range of motion of the first metatarsophalangeal joint or the number of corns and calluses present.
The multivariate analysis identified foot deformities as the most significant predictor of fall risk (OR = 34.449), with plantar fat pad atrophy (OR = 10.390) and foot pain, as measured by the MFPDI score (OR = 1.688), also being significant contributors.
Conclusion: Foot deformities, especially plantar fat pad atrophy, significantly contributed to fall risk in elderly individuals. Assessing and addressing these conditions in this population is crucial to prevent falls and related injuries.

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THE ROLE OF FOOTWEAR IN FALL RISK AMONG OLDER ADULTS

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Background: Falls are the primary source of injuries for individuals over 65 years (1). While many factors contribute to falls, footwear abnormalities are among the modifiable ones.
Objective: To assess the impact of footwear on fall risk among the elderly.
Methods: A cross-sectional comparative study was conducted, including patients aged 60 years or older who were able to walk independently and had no cognitive impairment. Various types of footwear, including athletic shoes, loafers, sandals, high heels, and slippers, were assessed. Key evaluation criteria included heel type, presence of a platform, upper material composition, and areas of wear. Participants were divided into two groups: 'fallers' and 'non-fallers', based on their fall history in the past 12 months. Both univariate and multivariate analyses were performed, with a significance level set at $p < 0.05$ for all tests.
Results: Ninety-six participants were included in the study (mean age = 67.2 ± 5.54 years; male-to-female ratio = 0.15). Forty-two participants (43.8%) reported at least one fall in the past year. Slippers were the most commonly worn footwear (78.6% of fallers and 63% of non-fallers), followed by sandals (14.3% of fallers and 29.6% of non-fallers) and athletic shoes (6% of fallers and 5.5% of non-fallers). Block heels were the most frequent heel type (64.3% of fallers and 53.7% of non-fallers), followed by wedge heels (35.7% of fallers and 35.2% of non-fallers). Platform shoes were worn by 52.3% of fallers and 37% of non-fallers. Stiffness of the upper material was observed in 81% of fallers and 63% of non-fallers. No significant differences were found between the two groups regarding shoe model, heel type, platform presence, or upper material stiffness. However, increased wear on the shoe soles was significantly more common among fallers (76.2% vs. 42.6%, p=0.001). Multivariate analysis indicated that sole wear was an independent predictor of fall risk (OR = 23.113, p=0.001).
Conclusion: Footwear characteristics, particularly wear on the soles, were associated with an increased risk of falls among the elderly. Regular monitoring of footwear condition may provide an opportunity for early intervention.
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P619

REMS TECHNOLOGY FOR THE PREVENTION AND REDUCTION OF FRAGILITY FRACTURES IN FRAGILE PATIENTS AND PREGNANT WOMEN

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Objective(s): The "SVOLTA" project (Development of a Service for the Prevention and Reduction of Fragility Fractures) aims to evaluate and monitor the reduction of bone mineral density (BMD) and fracture risk in young and elderly individuals, bedridden patients, immobilized individuals, and pregnant or breastfeeding women. The study addresses an unmet clinical need by providing systematic evaluation for patient's categories currently not assessable with existing diagnostic technologies. The aim is to boost participation in prevention programs, improve osteoporosis diagnosis, and ultimately reduce fragility fractures (FF), while ensuring continuous care, even for pregnant and breastfeeding women.

Material and Methods: 50 individuals aged 50-75 with primary fragility fractures and 50 women in their third trimester of pregnancy will be enrolled. Each patient' bone health will be assessed by DXA (at femur and spine) or REMS (through a simple and quick ultrasound scan at the same bone sites, or only the proximal femur for pregnant women, without exposing the patient to ionizing radiation) and will be monitored over time. Any bone density variations together with the quality of the bone microarchitecture and the 5-yrs imminent fracture risk will be monitored by REMS. Any occurrence of fractures or re-fractures during the follow-up will also be tracked.

Results: The expected outcomes of this study include optimizing the patient's continuity of care through the implementation of guidelines, preventing and reducing fragility fractures, and lowering costs for the National Health Service. Furthermore, the findings from this project will enable risk stratification for primary and secondary fracture in fragile patients, as well as the development of a risk chart to define treatment protocol for osteoporosis/fragility fractures and for pregnant and breastfeeding women.

Conclusion(s): The implementation of this model will address unmet clinical needs by accurately evaluating and monitoring potential reductions in BMD and the risk of FF in individuals who have not been assessable by X-ray techniques, promoting early diagnosis and facilitating the continuity of care also during pregnancy.

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BONE DENSITY, STRUCTURE AND STRENGTH, AND THEIR DETERMINANTS IN ATHLETE CHILDREN AND YOUTH

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Objectives. The influence of sport activity on bone development is known from the former sport anthropological studies, however the need of using athlete references in bone development estimation of athlete children and youth has just emerging in DEXA analysis practice. The main aim of the study was to construct bone mineral density (BMD) and bone mineral content (BMC), also BMD excluding the head (TBLH) references of athletes for the widely used DEXA scanner.

Methods. Subjects were 1385 athletes, 1019 males and 366 females, 11-20 years of age, who volunteered to participate in this cross-sectional study. The athletes represented several Hungarian sport academies – primarily basketball, football and handball, with smaller numbers for ice hockey and several individual sports: pentathlon, rhythmic gymnastics, swimming, athletics, fencing, kayak, canoe, rowing, wrestling, karate and weight-lifting. Age- and sex- specific means and standard deviations, and selected percentiles (10^{th}, 25^{th}, 50^{th}, 75^{th}, 90^{th}) were calculated for BMD, BMC and TBLH BMD using the LMS chart maker pro version 2.3.

Results. The athletes were grouped into single year chronological age groups with the whole year as the midpoint (11 years = 10.50 to 11.49, etc.). The total BMD of male athletes is considerably higher than the age-specific references for males ($p<0.001$ in each age-group). The median BMD curve exceeds the 90^{th} percentiles of the references. The corresponding trend for total BMD among female athletes also indicates higher BMD ($p<0.001$ in every age-group with the exception 20 years, $p=0.02$). The 25^{th} percentile for female athletes is higher than the 90^{th} percentile of the reference. The percentiles for BMC among male athletes are also consistently higher than the references ($p<0.001$ in every age-group). The median percentile of the athletes approximates the 90^{th} percentile of the references across the age range except at 12 years when the 25^{th} percentile of the athletes approximates the 90^{th} percentile of reference. The corresponding trends in the BMC of female athletes generally parallel the reference percentiles from 14 years on, and are significantly higher than the references ($p<0.001$ in every age-group, with the exception of 13 years, $p= 0.04$). Percentiles of BMD excluding the head (TBLH BMD in male athletes also differ from the references. The percentiles are higher than the references beginning at 11 years ($p<0.001$ in every age-group), and the 25^{th} percentiles of the athletes approximate the 90^{th} percentiles of the reference. The trend in TBLH BMD

percentiles of female athletes is similar to that noted in males ($p<0.001$ in every age-group with the exception of age-group 13, $p=0.04$).
Conclusion. Compared to reference values for the general population, BMD and BMC of the youth athletes were better developed. Comparison of DEXA observations of athletes with reference values for the general population must be done with care avoid potential misinterpretations.

P621

ALTERATION OF MINERALIZATION PROCESS AND ROLE OF ENDOCANNABINOID SYSTEM IN AN IN VITRO MODEL OF MANDIBULAR FIBROUS BONE DYSPLASIA

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Introduction: Fibrous bone dysplasia (FBD) is a rare skeletal disease, which is caused by a mutation in *GNAS* gene. The mutation in osteoprogenitor cells impairs their differentiation into mature osteoblasts and osteocytes. It has been observed that the Endocannabinoid System (ES) has also implicated in bone remodeling process. The aim of this work is to study the altered mineralization process and to assess how the ES may be involved in this alteration.
Materials and Methods: A primary cell line, marked as FD-1, was established and characterized by cellular and molecular biology analysis. An osteogenic differentiation assay was established for up to 28 days in FD-1 and in adipose tissue mesenchymal stem cell line, marked as PA24, to assess the expression and modulation of bone mineralization markers and ES genes. The analyses were carried out using Taqman technology.
Results: FD-1 was characterized as a mesenchymal stem line for the presence of mesenchymal stem cells markers (i.e. CD44 and CD105) and for the expression of *ADAMTS2,* identified as a marker gene of FBD. Following osteogenic differentiation, the expression of the main osteogenic differentiation genes (i.e. *OCN, OPG, RUNX2, RANKL, ALPL, DKK1*) was assessed in both lines studied. Significant differences were found in the expression levels of these genes and their modulation, indicating an altered mineralization process in FD-1. Differences were observed in the expression levels and modulation of the main ES receptors, *CB1* and *CB2*. Evaluation of alkaline phosphatase enzyme activity and hydroxyapatite deposition production levels in both differentiated FD-1 and PA24 is ongoing.
Conclusions and future prospects: The study carried out on FD-1 has allowed to highlight the alterations in the mineralization process, but also to observe, for the first time, the involvement of ES in this altered osteogenic process. Studies are underway to determine the expression levels of the other components of ES and to evaluate the effects of *in vitro* treatment with phytocannabinoids to identify new therapeutic targets and assess the possible therapeutic role of cannabinoids in this rare bone disease.
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INVOLVEMENT OF ENDOCANNABINOID SYSTEM IN HUMAN SKELETAL MUSCLE MYOGENESIS

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Introduction: In the last years several studies have demonstrated that the Endocannabinoid System (ES) plays an important role in numerous physiological and pathophysiological processes. Muscle regeneration is a finely regulated process involving satellite cells (SCs) and the activation of Myogenic Regulatory Factors (MRFs). The aim of the present work is to evaluate the presence and role of ES in an *in vitro* model of human skeletal muscle satellite cells and to investigate their possible involvement in myogenesis.
Materials and Methods: Two primary satellite cell lines, marked SC-1 and SC-2, were established from two human muscle biopsies. Both lines were characterized by cellular and molecular biology analysis. Subsequently, a myogenic differentiation assay was established for up to 9 days and the expression of MRFs (i.e. *Myf-5, MyoD-1, MRF-4* and *Myogenin*) and ES components was assessed at different time points (0, 3, 6 and 9 days). The expression levels of these genes were assessed using TaqMan technology.
Results: After characterization of the two SCs cell lines, an increase in the expression levels of MRFs and myogenic differentiation marker genes (*Desmin* and *Myosin Heavy Chain*) was observed following myogenic differentiation. The results obtained showed that the ES receptor genes (i.e., *CB1, CB2, TRPV1*) as well as those of the enzymes involved in the synthesis and degradation of endocannabinoids (i.e., *NAPE, FAAH, DAGLα*) are not only present in SCs, but also that their levels were positively modulated during the myogenic differentiation process in both cell lines studied, demonstrating how the ES is activated during this process. Studies on the effects of endocannabinoids on myogenic differentiation are ongoing.
Conclusions and future perspectives: Two cell lines of SCs from muscle tissue biopsies were established and characterized. This study demonstrated not only the presence of ES but also their positive modulation during myogenic differentiation. Thus, understanding the role of ES in skeletal muscle physiology is important for the possible future development of new therapeutic approach-

es in treatment of muscle diseases as well as therapies based on non-psychotropic phytocannabinoids contained in *Cannabis Sativa*.

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METABOLIC DETERMINANTS OF BONE HEALTH IN SPONDYLOARTHRITIS

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Objective: The aim of our study was to evaluate the relationship between adiposity indices and bone mineral density in patients with spondyloarthritis.

Material and methods: This was a cross-sectional study conducted over 2-month period (November-December 2024) involving patients followed for spondyloarthritis, according to the 2009 ASAS criteria. Socio-demographic and clinical data were collected. Adiposity indices were assessed using body mass index (BMI), waist-to-hip ratio, body fat mass pourcentage, visceral adiposity index (VAI), and hepatic steatosis index (HSI). The body fat mass percentage was calculated using the Deurenberg formula: (1.20 × BMI) + (0.23 × Age) − (10.8 × Sex) − 5.4 (1 for males and 0 for females). The VAI was calculated using the appropriate formula for each gender, incorporating waist circumference, BMI, and lipid profile parameters. The HSI was calculated using the formula: 8 × (ALT/AST) + BMI + 2 (if diabetic) + 2 (if female). Bone mineral density (BMD) was measured using dual-energy X-ray absorptiometry (DEXA) at the lumbar and femoral sites. Data analysis was performed using SPSS software. Results were considered statistically significant if the p-value was less than 0.05.

Results: A total of 54 patients were included. The sex ratio (M/F) was 6.71 (47 men and 7 women). The mean age was 41.07 years (range: 23–67 years). The mean age at disease onset was 35.01 years (range: 18–67 years). The mean disease duration was 6.26 years. The disease phenotypes were as follows: axial spondyloarthritis (n=28), axial and peripheral spondyloarthritis (n=20), arthritis associated with inflammatory bowel disease (n=5), and psoriatic arthritis (n=1). The mean weight was 75.94 kg ± 13.27 (range: 47–103 kg), and the mean BMI was 25.43 kg/m² ± 4.38 (range: 17.24–34.54 kg/m²). Three patients (5.56%) were underweight, 22 patients (40.74%) had normal weight, 22 patients (40.74%) were overweight, and 7 patients (12.96%) were obese. The mean waist-to-hip ratio was 0.918 ± 0.070 (range: 0.76–1.05). The mean body fat mass percentage was 25.17% ± 8.21 (range: 12.84–45.58%). The mean VAI was 1.59 ± 0.94 (range: 0.44–4.36). The mean HSI was 32.77 ± 5.35 (range: 22.11–46.42). The mean BMD at the lumbar spine and femoral sites was 1.12 g/cm² ± 0.216 (range: 0.724–1.862 g/cm²) and 0.956 g/cm² ± 0.155 (range: 0.641–1.446 g/cm²), respectively. The mean T-score at the lumbar spine was -0.933 SD ± 1.12 (range: -4.30 to 5.20 SD), while the mean T-score at the femoral site was -0.886 SD ± 0.98 (range: -3.50 to 3.70 SD). A total of 21 patients had normal bone mineral density. Low BMD was observed in 21 patients, with osteopenia in 16 patients and osteoporosis in 5 patients. In contrast, 2 patients presented with high bone density. Bone mineral density at the femoral site was positively correlated with weight (r = 0.569; p<0.001), waist circumference (r = 0.392; p = 0.006), HSI (r = 0.467; p = 0.001), and VAI (r = 0.390; p = 0.012). Bone mineral density at the lumbar spine was positively correlated with weight (r = 0.464; p = 0.001), waist circumference (r = 0.347; p = 0.015), and HIS (r = 0.446; p = 0.001). In multivariate linear regression analysis, waist circumference was significantly associated with bone mineral density at the lumbar spine (β = -0.673; p = 0.042).

Conclusion : Approximately 39% of our patients demonstrated reduced bone mineral density. A positive correlation was observed between various adiposity indices and bone mass, suggesting a potential link between these parameters. These findings highlight the importance of assessing metabolic and body composition factors in managing patients at risk of osteoporosis. Further studies are needed to confirm these associations.

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IS VITAMIN D DEFICIENCY LINKED TO INCREASED INFLAMMATORY ACTIVITY IN SPONDYLOARTHRITIS?

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Objective The aim of our study was to assess the 25-hydroxy vitamin D levels in patients with spondyloarthritis and investigate the association between vitamin D levels and disease activity.

Material and methods This was a cross-sectional study including patients diagnosed with spondyloarthritis (SpA) according to the 2009 ASAS criteria. The study was conducted over a 6-month period (July to December 2024).

Sociodemographic, clinical, and biological data were collected. Disease activity was assessed using ASDAS-CRP, ASDAS-ESR, and BASDAI.

The Systemic Inflammation Index (SII) was calculated based on the complete blood count using the following formula: SII = (Platelet count × Neutrophil count) / Lymphocyte count. 25-hydroxy vitamin D levels were measured using the chemiluminescence technique with the DXI Beckman Coulter system. Levels were classified as low when < 30 ng/mL: insufficiency (vitamin D levels between 10–30 ng/mL) and deficiency (vitamin D levels < 10 ng/mL).

Results A total of 62 patients were included. The mean age was 39.95 years (range: 23–68 years). The mean age at disease onset was 34.86 years (range: 18–67 years). The mean

disease duration was 5.26 ± 5.87 years. The SpA phenotypes were distributed as follows: axial SpA (n=34), axial and peripheral SpA (n=21), arthritis associated with inflammatory bowel disease (n=4), and psoriatic arthritis (n=3). The mean C-reactive protein (CRP) level was 8.50 ± 17.20 mg/L (range: 0–91 mg/L), and the mean erythrocyte sedimentation rate (ESR) was 25.05 ± 24.42 mm/h (range: 5–105 mm/h). The mean systemic inflammatory index (SII) was 644.972 ± 531.659 × 10^3 /µL (range: 109.666–2539.466 × 10^3/µL). Disease activity scores were as follows: ASDAS-CRP 1.93 ± 1.22 (range: 0–5.70), ASDAS-ESR 2.29 ± 1.12 (range: 0.70–6.20), and BASDAI 2.12 ± 1.71 (range: 0–8.10). The mean 25-hydroxyvitamin D level was 22.75 ± 7.62 µg/L (range: 6–50 µg/L). A normal vitamin D level was observed in 6 patients (9.7%). In contrast, 56 patients (90.3%) had low levels: vitamin D insufficiency in 55 patients and vitamin D deficiency in 1 patient. There was a significant negative correlation between vitamin D levels and CRP (p=0.012, r=-0.330) and between vitamin D levels and ASDAS-ESR (p=0.024, r=-0.307). Patients with low vitamin D levels were associated with higher disease activity: ASDAS-CRP (1.97 ± 1.28 vs 1.55 ± 0.43, p=0.033) and ASDAS-ESR (2.36 ± 1.15 vs 1.64 ± 0.19, p=0.039). Multivariate analysis showed a negative correlation between vitamin D levels and ASDAS-ESR (β=-0.744, p=0.042).

Conclusion Low vitamin D levels are significantly associated with higher disease activity in patients with spondyloarthritis. Supplementing vitamin D insufficiency may help control inflammation and improve disease management in this population.

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ATTITUDES AND PRACTICES OF RHEUMATOLOGISTS IN MANAGING AVASCULAR NECROSIS OF THE FEMORAL HEAD

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Objective The aim of this study was to evaluate the attitudes and experiences of rheumatologists in the management of avascular necrosis of the femoral head (ANFH).
Material and Methods A cross-sectional descriptive study was conducted among rheumatologists from December 2024 to January 2025 using a self-administered online questionnaire. The questionnaire was designed and distributed via Google Forms.
Results Fifty-one rheumatologists (42 women, 9 men) participated in the questionnaire. The mean age was 40 years (range 26–70). The average duration of practice was 14.4 years (range 1–39). Among the respondents, 13.7% were trainees and 86.3% were senior practitioners. Overall, 84.3% worked in hospitals and 15.7% in private practice.
ANFH was perceived as rare by 70.6%, very rare by 15.7%, and frequent by 13.7%. The main presenting complaint was hip pain (72.5%), followed by limping or functional impairment (19.6%), and referral from another practitioner (3.9%). At first consultation, Arlet and Ficat stage 2 (56.9%) was most common, followed by stage 3 (23.5%), stage 1 (13.7%), and stage 4 (5.9%).
In patients with painful hip and normal radiographs, 72.5% ordered pelvic MRI, while 15.7% ordered pelvic MRI only under specific circumstances. For unilateral ANFH at Stage ≥ 2, 51% systematically requested MRI to guide management, 70.6% to detect contralateral involvement, 17.6% to confirm the stage, and 5.9% considered radiographs sufficient. Additional joint involvement was systematically investigated by 60.8% of respondents, typically via standard radiographs (57.8%) or bone scintigraphy (46.7%). Etiological factors were investigated by 98% of participants. Regarding leg-length discrepancy, 49% did not assess it routinely, 31.4% checked it systematically, 29.4% corrected it with heel lifts after hip replacement, and 13.7% performed systematic evaluation post–hip replacement to prevent contralateral collapse. Hyperbaric oxygen therapy was not used by 82.4% of respondents, however, 15.7% employed it in the early stages with favorable outcomes. As for bisphosphonates, 78.4% reported having no experience, 17.6% considered them experimental, and 5.9% observed mixed results. Core decompression was not performed by 35.3%, indicated as first-line therapy in early stages by 29.4%, and combined with bone grafting by another 29.4%. Treatment decisions were primarily guided by radiographic stage (96%), patient age (82%), and the hip's algofunctional index (74%). Furthermore, 54.9% of rheumatologists considered early-stage medical therapy to be successful, while 45.1% regarded it as disappointing. Additionally, 78.4% estimated that ANFH is a complex pathology with management protocols that are not yet clearly standardized.
Conclusion The majority of rheumatologists in our study recognized the complexity of ANFH and underscored the need for standardized management protocols. Establishing unified guidelines could enhance patient outcomes and improve clinical practices.

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ETHICAL DILEMMAS IN RHEUMATOLOGY: A CLINICAL APPROACH

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Objective The aim of this study was to assess the frequency and nature of ethical dilemmas faced in rheumatology practice, as well as the approaches favored by physicians to address them.
Material and methods A cross-sectional descriptive study was conducted among rheumatologists from December 2024 to January 2025 via a self-administered online questionnaire. The questionnaire was designed using Google Forms. Ten real-life ethical scenarios were developed to explore practitioners' perspectives.
Results Thirty rheumatologists participated in the survey. The mean age was 28.66 years (range 25–43). There were 28 women and 2 men. Most participants (80%) were residents, 13.3% hospital-university, and 6.7% hospital-sanitary.

In the scenario of an elderly illiterate patient with chronic inflammatory rheumatism, 13.3% delegated medical decisions to the partner, 30% to children, and 63.3% demanded the patient's consent before sharing any information. Among patients in a terminal phase, 50% believed that directly revealing the diagnosis to family members violated medical confidentiality, while 33.3% believed that simply confirming the fatal outcome was also a breach of confidentiality. When a relative requested a medical report, 40% felt that providing it without telling the patient broke confidentiality, and 33.3% considered that allowing chart review or giving oral explanations posed the same issue. In cases where pre-anti-TNF testing revealed a positive HBsAg, 86.7% informed the patient about the need to screen the partner, 10% contacted the wife directly or let the patient tell her, and 6.7% requested tests without patient consent. For a suspected multiple myeloma in an asymptomatic patient, 56.7% disclosed the possible diagnosis and explained the need for a bone marrow biopsy, while 50% preferred to wait for biopsy results. In a young patient with severe sciatica and a history of dependence, 43.3% prescribed low-dose opioids under surveillance, 80% referred the patient to a pain-management center, and 3.3% either prescribed strong opioids or refused analgesics. Faced with a patient with advanced lung cancer bone metastases refusing palliative care, 86.7% insisted he remains in the hospital despite his refusal, whereas 7% allowed discharge against medical advice or informed his family. In a 28-year-old woman with idiopathic osteoporosis worried about bisphosphonate teratogenicity, 56.7% suggested egg preservation or deferring treatment until after pregnancy, 46.7% respected her refusal and offered alternatives, 23.3% underscored fracture risks, and 13.3% recommended closer follow-up. For announcing chronic inflammatory rheumatism to a patient who wanted her partner present, 80% suggested a private discussion first, 16.7% refused any additional presence, and one physician immediately agreed to include him. Finally, when a patient with rheumatoid arthritis wished to discontinue specialized care, 86.7% explained the risks, 26.7% respected her decision, and 2 rheumatologists opposed it. **Conclusion** This survey highlights the complexity of ethical dilemmas in rheumatology, emphasizing the delicate balance between patient autonomy, confidentiality, and shared decision-making. Clear guidelines and targeted ethics training are needed.

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IMPACT OF MODERATE PHYSICAL ACTIVITY ON BONE HEALTH IN SPONDYLOARTHRITIS: A CROSS-SECTIONAL STUDY

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Objective The aim of this study was to evaluate the association between physical activity levels and bone mineral density in patients diagnosed with spondyloarthritis. **Material and Methods** This was a cross-sectional study involving patients followed for spondyloarthritis (SpA), according to the 2009 ASAS criteria. The study was conducted over a 6-month period (July to December 2024). Socio-demographic and clinical data were collected. Physical activity was assessed using the IPAQ questionnaire. The data collected included the number of days per week and the minutes per day of vigorous, moderate, and walking activities. The results in metabolic equivalent tasks (MET), expressed in minutes per week (min/week), were calculated, and activity levels were categorized as inactive, moderately active, or very active. Bone mineral density (BMD) was measured using dual-energy X-ray absorptiometry (DEXA) at the lumbar and femoral sites. Data analysis was performed using SPSS software. Results were considered statistically significant if the p-value was less than 0.05. **Results** A total of 48 patients were included in the study. The male-to-female ratio was 3.8 (38 men and 10 women). The mean age was 40.65 years (range: 23 - 67 years). The mean age at disease onset was 35.17 years (range:18 - 67 years). The average disease duration was 5.71 years. The phenotypes of SpA were categorized as follows: axial SpA (n=25), axial and peripheral SpA (n=15), rheumatism associated with inflammatory bowel disease (n=5), psoriatic arthritis (n=2), and SAPHO syndrome (n=1). The mean MET/min/week for intense, moderate, and light activities were 959.27 ± 2 546.64 (range: 0–13 440), 1 112.08 ± 1 938.15 (range: 0–10 080), and 1 002.92 ± 1 725.26 (range: 0–10 080), respectively. The total MET/min/week was 2 735.75 ± 3 440.59 (range: 120–15 066). Based on activity levels, 11 patients were classified as inactive, 23 patients as having moderate activity, and 14 patients as very active. The mean lumbar spine T-score was -0.94 ± 1.55 standard deviations (SD) (range: -4.30 - 4.70 SD). The mean femoral T-score was -0.814 ± 1.22 SD (range: -2.90 - 3.70 SD). The average lumbar spine BMD was 1.117 g/cm² ± 0.185 (range: 0.724 - 1.806 g/cm²). The femoral BMD was 0.959 g/cm² ± 0.145 (range: 0.710 - 1.446 g/cm²). Twenty patients had normal BMD. Twenty-seven patients showed reduced BMD, including 17 cases of osteopenia and 10 cases of osteoporosis. Only one patient presented with increased bone mineral density. The T-scores at the vertebral and femoral sites were higher in active patients compared to inactive patients, but the differences were not statistically significant (-0.897 ± 1.169 SD vs -1.618 ± 1.703 SD, p=0.116; and -0.745 ± 1.255 SD vs -1.136 ± 1.128 SD, p=0.362, respectively). A significant positive correlation was observed between the lumbar spine T-score and MET for moderate activities (r=0.352, p=0.014), as well as between the femoral T-score and MET for moderate activities (r=0.311, p=0.033). Additionally, a significant positive correlation was identified between lumbar spine bone mass and MET for moderate activities (r=0.394, p=0.007) and with total MET (r=0.326, p=0.029). **Conslusion** This study demonstrated a significant positive association between moderate physical activity and bone mineral density in patients with spondyloarthritis. These findings indicate that maintaining even moderate levels of physical activity may en-

hance bone health in this population.

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INFLUENCE OF MEDITERRANEAN DIET ADHERENCE ON SYSTEMIC INFLAMMATION AND DISEASE ACTIVITY IN SPONDYLOARTHRITIS

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Objective To evaluate the relationship between adherence to the Mediterranean diet, systemic inflammation, and disease activity in patients with spondyloarthritis (SpA). **Material and Methods** This was a cross-sectional study involving patients diagnosed with SpA according to the 2009 ASAS criteria. The study was conducted over a three-month period (November 2024 to January 2025). Socio-demographic, clinical, and biological data were collected. Dietary habits were assessed using the Chrono Med-Diet Score (CMDS), which evaluates 11 food categories: fruits, vegetables, legumes, refined products, whole cereals, fish, meats and meat products, milk and dairy, olive oil, butter, margarine and lard, and alcohol consumption. Additionally, it includes two categories: timing of refined product intake and physical activity. The final CMDS score ranges from −13 to 25, with higher scores reflecting greater adherence to the Mediterranean diet. Disease activity was assessed using ASDAS-CRP, ASDAS-ESR, and BASDAI. The Systemic Inflammation Index (SII) was calculated using the following formula: SII = (Platelet count × Neutrophil count) / Lymphocyte count. Data analysis was performed using SPSS software. A p-value of less than 0.05 was considered statistically significant. **Results** Forty-three patients were included in the study. The male-to-female ratio was 5.14, with 36 men and 7 women. The mean age was 40.33 years (range: 23-65 years). The mean age at disease onset was 34.38 years (range: 18-62 years). The average disease duration was 6.19 years. The mean CRP level was 6.16 ± 10.95 mg/L (range: 0-45 mg/L). The mean ESR was 25.04 ± 23.36 mm/h (range: 5-91 mm/h). The mean SII was 558.810 ± 416.387 × 10^3/µL (range: 109.666 - 2109.937 × 10^3/µL). The mean scores for ASDAS-CRP, ASDAS-ESR, and BASDAI were 1.86 ± 1.20 (range: 0-5.70), 2.18 ± 1.14 (range: 0.70-6.20), and 2.09 ± 1.85 (range: 0-8.10), respectively. The mean CMDS score was 9.58 ± 4.64 (range: 2-20). A significant negative correlation was observed between fruit consumption and ASDAS-ESR (r = -0.342, p = 0.044), as well as between vegetable consumption and ESR (r = -0.363, p = 0.032). Additionally, a significant negative correlation was found between fish consumption and SII (r = -0.385, p = 0.020). A significant positive correlation was identified between the consumption of refined products and ASDAS-CRP, ASDAS-ESR, and CRP levels (r = 0.415, p = 0.012) (r = 0.400, p = 0.021) and (r = 0.464, p = 0.007). **Conclusion** Adherence to the Mediterranean diet, particularly the consumption of fruits, vegetables, and fish, was associated with lower inflammation and disease activity in SpA patients in our study. These findings emphasize the potential benefits of dietary adjustments in the management of SpA.

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THE IMPACT OF THE MEDITERRANEAN DIET ON BONE MINERAL DENSITY IN SPONDYLOARTHRITIS

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Objective To assess the relationship between adherence to the Mediterranean diet, as measured by the Chrono Med-Diet Score (CMDS), and bone mineral density in patients with spondyloarthritis. **Material and Methods** This was a cross-sectional study involving patients followed for spondyloarthritis (SpA), according to the 2009 ASAS criteria. The study was conducted over a 3-month period (Novembre 2024 to January 2025). Socio-demographic and clinical data were collected. Dietary habits were assessed using the Chrono Med-Diet Score (CMDS), which evaluates 11 food categories: fruits, vegetables, legumes, refined products, whole cereals, fish, meats and meat products, milk and dairy, olive oil, butter, margarine and lard, and alcohol consumption. Additionally, it includes two categories: timing of refined product intake and physical activity. The final CMDS score ranges from −13 to 25, with higher scores reflecting greater adherence to the Mediterranean diet. Bone mineral density (BMD) was measured using dual-energy X-ray absorptiometry (DEXA) at the lumbar and femoral sites. Data analysis was performed using SPSS software. Results were considered statistically significant if the p-value was less than 0.05. **Results** Forty patients were included in the study. The male-to-female ratio was 5.66 (34 men and 6 women). The mean age was 40.60 years (range: 23–65 years). The mean age at disease onset was 34.25 years (range: 18–62 years). The average disease duration was 6.60 years. The SpA phenotypes were distributed as follows: axial SpA (n=20), axial and peripheral SpA (n=13), arthritis associated with inflammatory bowel disease (n=4), psoriatic arthritis (n=2), and SAPHO syndrome (n=1). The mean lumbar spine T-score was −0.957 ± 1.635 SD, and the mean femoral T-score was −0.840 ± 1.308 SD. Bone mineral density was 1.120 ± 0.193 g/cm² at the lumbar spine and 0.964 ± 0.156 g/cm² at the femur. Sixteen patients had normal BMD, while 23 patients presented reduced BMD (osteopenia in 14 patients and osteoporosis in 9 patients). One patient had increased BMD. The mean final CMDS score was 9.65 ± 4.7 (range: 2–20). Patients with normal BMD had a higher mean CMDS score compared to those with reduced BMD, with no statistically significant difference (11 ± 4.65 vs 8.41 ± 4.63, p=0.092). A statistically significant higher olive oil consumption was observed in patients with normal BMD compared to those

with reduced BMD (1.71 ± 0.469 vs 1.10 ± 1.165, p=0.043). A significant positive correlation was observed between the final CMDS score and femoral T-score (r=0.389, p=0.014) as well as femoral bone mass (r=0.449, p=0.005). Additionally, a significant positive correlation was found between the timing of refined product intake—specifically consumption earlier in the day—and the femoral T-score (r=0.493, p=0.004) and femoral BMD (r=0.501, p=0.004). However, a significant negative correlation was identified between fish consumption and vertebral T-score (r=-0.501, p=0.003) as well as vertebral BMD (r=-0.473, p=0.005). **Conclusion** Good adherence to the Mediterranean diet was associated with normal bone mineral density in our study, particularly the use of olive oil and the early consumption of refined products during the day.

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LOW SERUM CREATININE IN RHEUMATOID ARTHRITIS: ASSOCIATED FACTORS

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Objectives The aim of this study was to evaluate serum creatinine levels in patients with rheumatoid arthritis (RA) and determine the factors associated with a decline in these levels.
Material and methods This was a retrospective study including 95 patients diagnosed with RA based on the ACR-EULAR 2010 criteria, followed in an internal medicine department from January 2015 to December 2023. Serum creatinine levels were extracted from medical records. Epidemiological, biological, radiological characteristics, and treatments received were collected. Low serum creatinine levels were defined as <60 µmol/L in men and <45 µmol/L in women. Patients with chronic kidney disease were excluded.
Results Ninety-five patients were included, with a mean age of 61.74 ± 14.70 years. The mean age at disease onset was 48.53 ± 15.68 years. The mean disease duration was 12.64 ± 9.69 years. The sex-ratio (F/M) was 4.59. The mean serum creatinine level was 62.27 ± 16.63 µmol/L (range: 25–111 µmol/L). The mean CRP level was 26.38 ± 30.97 mg/L. The mean DAS28-CRP score was 4.09 ± 1.16. The mean glomerular filtration rate was 91.78 ± 19.71 mL/min/1.73 m² (range: 45.49–142.44 mL/min/1.73 m²). Serum creatinine levels were positively correlated with age (p=0.032; r=0.229) and age at disease onset (p=0.005; r=0.320) and negatively correlated with CRP levels (p=0.046; r=-0.214), DAS28-CRP scores (p=0.009; r=-0.359), and corticosteroid dosage (p=0.040; r=-0.223). Thirteen patients (16.68%) had low serum creatinine levels. Low serum creatinine was significantly associated with age at disease onset and DAS28-CRP scores (p=0.020 and p=0.019, respectively). All these patients were on biologic therapy.
Conclusion In our study, 16.68% of RA patients presented with abnormally low serum creatinine levels. This decline was associated with age at disease onset, inflammation, and disease activity. These findings suggest that low serum creatinine may serve as an additional marker for monitoring disease progression and guiding therapeutic decisions in RA patients.

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EROSIVE RHEUMATOID ARTHRITIS: A STUDY OF ASSOCIATED FACTORS

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Objective The aim of this study was to investigate the specific characteristics of erosive rheumatoid arthritis (RA).
Material and methods This was a retrospective study involving 70 patients diagnosed with RA according to the ACR-EULAR 2010 criteria. Sociodemographic characteristics, as well as clinical, biological, and radiographic parameters, were collected. The patients were divided into two groups: G0 (non-erosive RA) and G1 (erosive RA).
Results Seventy patients were included in the study. The sex ratio (F/M) was 7.75. The mean age was 61.10 ± 14.74 years. The mean age at disease onset was 47.52 ± 16.12 years. The mean disease duration was 13.54 ± 9.95 years. Fifty-four patients (77.14%) had erosive RA. No significant differences were found between the two groups regarding sex (p=0.878), age (p=0.079), and age at disease onset (p=0.635). Disease duration was significantly longer in the erosive group (15.54 ± 9.88 years vs 7.13 ± 7.28 years; p=0.001). Erosive disease was significantly associated with rheumatoid factor (RF) positivity, with a higher prevalence in the G1 group compared to the G0 group (91.11% vs 69.23%; p=0.044). No significant differences were observed regarding seropositivity for anti-citrullinated protein antibodies (ACPA) (p=0.344), extra-articular manifestations (p=0.453), or associated autoimmune diseases (p=0.273). The CRP levels were significantly higher in the G1 group compared to the G0 group (32.43 ± 36.11 mg/L vs 9.11 ± 8.52 mg/L; p<0.001). Therapeutically, no significant differences were found in the use of conventional synthetic DMARDs (CsDMARDs) or corticosteroids. However, the duration of corticosteroid treatment was significantly longer in the G1 group compared to the G0 group (10.41 ± 8.28 years vs 4.82 ± 3.97 years; p=0.047). Biologic therapies were also more frequently prescribed in the G1 group than in the G0 group (31.48% vs 6.25%; p=0.043).
Conclusion Erosive rheumatoid arthritis was associated with longer disease duration, higher RF positivity, and significantly elevated CRP levels compared to the non-erosive form in our study. Patients with erosive RA required longer corticosteroid treatment durations and benefited more frequently from biologic therapies. These findings highlight the importance of distinguishing between erosive and non-erosive forms of RA to personalize therapeutic approaches.

P632

FAT MASS INDEX AS A PREDICTOR OF METABOLIC AND INFLAMMATORY STATUS: A CROSS-SECTIONAL STUDY IN HEALTHY ADULTS

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Objective: The study aimed to investigate the relationship of fat mass index (FMI) and metabolic and inflammatory markers.
Material and Methods: Study included 169 healthy individuals (60 men and 109 women aged 20-49 years). Body composition including fat mass was measured by dual-energy X-ray absorptiometry (iDXA, GE Lunar), FMI was calculated (FMkg/height^2). Participants were divided into 3 groups based on FMI: low fat (female FMI<5 kg/m², male FMI<3 kg/m²), normal fat (female FMI5-9kg/m²,male FMI3-6kg/m²), and high fat (female FMI>9 kg/m², male FMI>6 kg/m²). Lipid profile, glucose, insulin, and C-reactive protein (CRP) were measured. One-way ANOVA test was used to compare groups, multivariable linear regression analysis - to evaluate the association. The study was approved by the Ethics Committee, all participants provided informed consent.
Results: A total of 99 (58.6%) of participants had high fat, and 11 (6.5%) had low fat. Individuals with high fat had significantly higher fat in each body region compared to those with normal fat (respectively: total fat 40.34%vs.27.9%, trunk fat 43.4%vs.26.4%, android fat 50.7%vs.31.6%, gynoid fat 47.2%vs.37.3%, appendicular fat 38.9%vs.29.9%). High fat individuals had significantly higher LDL-cholesterol (3.31±0.86 vs. 2.85± 0.65 mmol/L), triglycerides (1.29±0.77vs.0.92±0.54mmol/L), glucose (5.55±0.43 vs. 5.11±0.48 mmol/L), insulin (13.28±7.61vs.6.79±2.91mU/L), and CRP (2.71±3.16vs0.69±0.61 mg/L), and lower HDL-cholesterol (1.39±0.32vs1.81±0.44 mmol/L) levels compared to those with normal fat. Regression analysis revealed positive association of FMI with LDL-cholesterol (β=0.55, 95% CI 0.02–1.07, p=0.043), glucose (β=1.34,95% CI 0.33–2.35, p=0.01), insulin (β=0.18, 95% CI 0.10–0.26, p<0.001) and CRP (β=0.45, 95% CI 0.27–0.63, p<0.001) and inverse association with HDL-cholesterol (β= -1.85, 95% CI -3.18 – -0.52, p=0.007)
Conclusions: Healthy adults with high fat exhibit a less favourable metabolic profile. FMI is associated with cholesterol, glucose, insulin and CRP levels, making it a valuable predictor of metabolic and inflammatory status.

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BODY COMPOSITION AND ADIPOSITY INDEXES IN WOMEN WITH ANOREXIA NERVOSA

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Objective: The study aimed to investigate the body composition of women diagnosed with anorexia nervosa (AN) and to assess the discriminating abilities of adiposity indexes for predicting AN.
Material and Methods: The study included 24 women with AN and 45 healthy women with a body mass index (BMI) < 30 kg/m². Body composition was measured by dual-energy X-ray absorptiometry (iDXA, GE Lunar). Fat mass index (FMI) and lean mass index (LMI) were calculated. Low fat was defined as FMI <5kg/m². Underweight was defined as BMI <18.5kg/m². Statistical analysis included descriptive statistics, Student's t-test, ROC analysis, and the Youden index. The study was approved by the Ethics Committee, and all participants provided informed consent.
Results: Women with AN had lower total bone mass (2.11±0.35 vs. 2.45±0.27 kg), fat mass (8.96±4.05 vs. 18.65±5.25 kg), lean mass (35.57±3.53 vs. 40.72±4.66 kg), FMI (3.19±1.47 vs.6.42±1.66 kg/m²), and LMI (12.61±0.93 vs. 14.05±1.07 kg/m²) compared to healthy women (p<0.001). They also had lower fat in each body region: trunk (15.03% vs. 27.01%), android (15.94% vs. 31.83%), gynoid (27.65% vs. 43.42%), and appendicular (23.27% vs. 35.30%). A fat deficit was observed in 91.7% of women with AN compared to 17.8% of healthy women. 87.5% of women with AN and 13.3% of healthy women were underweight. ROC analysis revealed that FMI and BMI had comparable discriminating abilities for AN: FMI AUC 0.93 (95% CI 0.86 – 0.99, p < 0.001) and BMI AUC 0.95 (95% CI 0.90 – 1.00, p < 0.001). A BMI of 17.61 kg/m² discriminates healthy women with 97.8% sensitivity and 87.5% specificity, while an FMI of 4.89 kg/m² discriminates healthy women with 84.4% sensitivity and 91.67% specificity.
Conclusions: Women with anorexia nervosa exhibited significantly lower bone, fat, and lean mass, with a marked fat deficit compared to healthy women. Both FMI and BMI demonstrated strong discriminatory abilities for predicting AN, with high sensitivity and specificity.

P634

PREDICTORS OF 5-YEAR SURVIVAL IN PATIENTS WITH HIP FRACTURE: FINDINGS FROM A PROSPECTIVE REAL-WORLD STUDY

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Objective: older patients with hip fractures (HF) are complex to manage, impacting both health and economic systems. Identifying those with longer survival may help to better allocate resources and develop more appropriate treatments. However, no real-world study has focused on such an approach. Main objective of this study is to identify predictors of 5-year survival since hospital admission and within 30-day post-surgery.
Material and methods: prospective observational study conducted on older patients affected by HF, who underwent a comprehensive geriatric assessment (CGA) at baseline and 30 days after discharge. CGA includes measures of comorbidity, polypharmacy, and pre- and post-fracture functional status according to Basic Activities of Daily Living (BADL).
Results: among 231 HF patients recruited, the 5-year survival rate was 38.3% for men and 61.9% for women. At hospital admission, pre-fracture BADL level was a protective factor (HR 0.742; 95% CI 0.668-0.825), while age (HR 1.070; 95% CI 1.037-1.105) and multimorbidity (HR 1.096; 95% CI 1.007-1.193) were independent mortality risk factors. At the 30-day post-discharge follow-up visit, the BADL recovery gap (HR 1.439; 95% CI 1.158-1.789) and pre-fracture BADL (HR 0.621; 95% CI 0.528-0.730), were independent predictors of 5-year survival, independent of comorbidity (HR 1.083; 95% CI 0.994-1.179).
Conclusion: more than half of patients with a HF survives for more than 5 years after surgery. The main factors affecting survival are pre-fracture functional status and functional recovery in the first 30 days after surgery. Although more evidence is needed, our findings might help to better tailor interventions for secondary prevention of fragility fractures and improving quality of life.

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MANAGEMENT OSTEOPOROTIC VERTEBRAL FRACTURES: CONSERVATIVE VERSUS SURGICAL?

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Introduction: Osteoporotic vertebral fractures (OVF) are among the most debilitating complications of osteoporosis, significantly impacting patient morbimortality and quality of life.[1] Most patients with OVF achieve pain relief within 3–6 weeks with conservative treatment, however, the risk of secondary fractures increases more than fourfold.[2-4]
Aim: To evaluate and compare patients with OVF treated conservatively and surgically, and to identify factors influencing the likelihood of surgical intervention.
Methods: We retrospectively identified patients ≥ 50 years old with OVF admitted in our FLS between 2023 and 2024. The patients were categorized into two groups based on whether they received conservative (group 1) or surgical treatment (group 2). Demographic data, comorbidities, fracture location, type, and severity were collected. Data analysis was performed using SPSS version 25.
Results: A total of 119 patients were included, the majority were women (86.6%). The mean age was 84.4±8.6 in group 1 and 73.9±7.8 years old in group 2 ($p<0.001$). The body mass index was 25.8±4.6 in group 1 and 27.1±4.6 Kg/m^2 in group 2 ($p<0.001$). The lumbar spine was the most affected site, followed by the thoracic in both groups. Wedge-type fractures were the most frequent in both groups (71.6% in group 1 and 46.7% in group 2) ($p = 0.001$). The majority of OVF were classified as severe (61.4% and 66.7%), followed by moderate (26.1% and 23.3%) and mild fractures (12.5% and 10.0%) in groups 1 and 2, respectively. In group 2, 74.2% of patients underwent surgical treatment due to persistent intractable back pain. Older age was associated with less surgical intervention [OR de 0.86 (IC 95%: 0.81–0.92, $p < 0.001$)].
Conclusion: Surgical intervention in OVF was primarily driven by severe pain, and occurred in younger patients. These results emphasize the importance of individualized management strategies for OVF to optimize outcomes and address the specific needs of different patient subgroups.
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P636

SYSTEMIC SCLEROSIS WITH AND WITHOUT LUNG INVOLVEMENT: COMPARATIVE CHARACTERISTICS OF THE CLINICAL PICTURE OF THE DISEASE

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Objective: The aim of the study was to comparatively evaluate the clinical picture of Systemic sclerosis (SSc), occurring with and without lung involvement.
Methods: 87 patients with a reliable diagnosis of SSc were examined. Average age is 52.7±13.2 years. Average duration of the disease is 12.0±10.8 years. The ratio of clinical forms is diffuse: limited: crossed: juvenile as 18:52:15:2. The initial stage of SSc was diagnosed in 3.4%, the stage of advanced clinical manifestations – in 66.7%, late – in 29.9% of patients. High degree of SSc activity was noted in 11.5%, moderate – in 72.4%, low - in 16.1% of cases. All patients underwent computed tomography (CT) of the chest organs.
Results: Radiological signs of lung damage according to CT data were detected in 66 patients with SSc (75.9%), of which only in every 3rd case (25 patients) were linear and reticular changes detected, while in 41 patients, areas of local increase (ground glass opacity, consolidation areas) or decrease (honeycomb lung symptom, bronchiectasis, bullae) of lung tissue density were detected. Almost all patients had dyspnea of varying severity (in 45.4% of cases – with little physical exertion) and unproductive cough. The comparison group consisted of 21 patients without CT signs of lung damage. Patients with CT signs of lung damage did not differ statistically significantly in the age of SSc onset (42.2±15.4 years versus 36.3±14.4 years, p=0.078) and disease duration (12.5±11.4 years versus 10.4±9.1 years, p=0.884). Respiratory tract damage was noted on average 3.2±2.2 years after SSc onset. Lung damage was detected in different clinical forms of SSc: in 16 (89%) of 18 patients with the diffuse form, in 38 (73%) of 52 with the limited form, and in 10 (67%) of 15 with the overlap form. In patients without lung damage, the limited form prevailed. In 2 patients with SSc onset in adolescence, lung damage was not noted. The overall SSc activity index was higher in patients with lung lesions (3.4±1.8 vs. 2.7±1.3, p=0.045). Digital ischemia (ulcers, scars) was detected in 13 patients with lung lesions, and only in 1 case in the comparison group (pχ2=0.094). No reliable differences (pχ2=0.856) were obtained in the frequency of arthritis in patients of both groups. Pulmonary arterial hypertension (PAH) was detected in almost every 3rd patient with lung lesions (30.3%), while in the absence of pneumopathy only in 1 patient (4.8%, pχ2=0.037). Other visceropathies were significantly more often detected in patients with radiographic lung damage: kidney damage (pχ2=0.043), heart (pχ2=0.042) and gastrointestinal tract damage (pχ2=0.028). The frequency of detection of antibodies to Scl-70 was 2 times higher in patients with lung damage (18.2% versus 9.5%, pχ2=0.347), while anticentromere antibodies were more often detected in patients without lung damage (33.3% versus 19.7%, pχ2=0.196). Over the 8-year observation period, 2 patients (men) with diffuse SSc (with a disease duration of up to 1 year) died in the group of patients with lung damage; the cause of death in both cases was rapidly progressing renal failure.
Conclusion: CT signs of lung damage were detected in 76% of SSc patients. Such patients had a later onset of the disease, a high SSc activity index, a higher frequency of visceropathies and PAH.

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A STRUCTURE OF COMORBID PATHOLOGY AND ITS RELATIONSHIP WITH CLINICAL AND ULTRASONIC FEATURES OF PSORIATIC ARTHRITIS

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Objective: Psoriatic arthritis (PsA) is characterized by heterogeneity of clinical manifestations and is associated with the development of comorbid pathology (CP). CP in PsA, compared to other chronic inflammatory arthritis, is poorly studied, as well as its effect on the activity of the underlying disease. Purpose of this study was to study the structure of CP and its relationship with clinical, ultrasound and laboratory activity of PsA.
Methods: The study included 63 patients from 18 to 60 years old, with an established diagnosis of PsA, among whom there were 33 (52.4%) female and 30 (47.6%) male patients. The average age was 42.9±10.3 years, PsA duration was 7 (3; 10) years, psoriasis duration was 10 (8; 22) years; DAPSA 16.5 (11.6; 25), PASI 6.1 (1.5; 14.4), NAPSI 42 (12; 73), hs-CRP 8.7 (2.7; 20.8) g/l, ESR 20 (11; 30) mm/h, BMI 27±4.7 kg/m2; cutaneous psoriasis in 62 (98.4%), psoriatic onychodystrophy in 54 (85.7%) patients. All patients underwent clinical examination (number of swollen joints, number of painful joints, number of painful entheses), CP analysis (structure, number of comorbid diseases), ultrasound (US) examination of large joints and entheses of the upper and lower extremities (882 joints, 3402 entheses).
Results: Among the immune-mediated diseases (12.8%) there were inflammatory bowel diseases (Crohn's disease) (1.6%), autoimmune thyroiditis (4.8%), uveitis (3.2%), diabetes mellitus (DM) type 1 (3.2%). Anemia (chronic inflammation and iron deficiency) in 20.6%, osteoporosis – 9.5%, osteopenia – in 1.6% of patients. The presence of more than 1 CP was noted in 56.3% of patients. Cardiovascular diseases were observed in 34.9% of patients: arterial hypertension 34.9%, ischemic heart disease 4.8%, atherosclerosis in 22.2% of patients, acute cerebrovascular

accident in 1.6% of patients. Among endocrine diseases, type 2 diabetes mellitus (9.5%) and hypothyroidism of various etiologies (6.3%) were identified. Gastrointestinal diseases were present in 37.5% of patients, among which cholelithiasis (4.8%), gastric ulcer and duodenal ulcer (12.7%) prevailed. Other diseases of the musculoskeletal system included gout (3.2%) and osteoarthritis (17.5%). ENT diseases were observed in 9.5% of patients. Diseases of the urinary system were present in 11.2% of patients. Obesity (BMI> 30 kg/m2) – in 27% of patients. The number of CP correlated with age (r=0.454, p<0.01), with the number of synovitis (r=0.308, p<0.05). The relationship between the number of CP and anthropometric and clinical data was not revealed (p>0.05). A higher number of CP was significantly more common among women (p<0.05).

Conclusion: The presence of more than 1 CP was noted in 56.3% of patients. Most patients have CP, primarily CVD, gastrointestinal and musculoskeletal diseases, as well as immune-mediated conditions (12.8%). The number of CP increased with age and was more common among women (p<0.05). The number of CP was not associated with clinical data, including PsA and psoriasis activity, laboratory markers of inflammation. Among the ultrasound data, a relationship was found between the number of CP and the number of ultrasound synovitis.

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EFFECTS OF CERVICAL DECOMPRESSION AT THE C2-C4 SEGMENTS ON SCAPULAR UPWARD ROTATOR STRENGTH IN SUBJECTS WITH SCAPULAR DOWNWARD ROTATION SYNDROME

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Objective

To investigate the effect of cervical decompression (CD) in C2-C4 segments on scapular upward rotator strength (SURS) in individuals with scapular downward rotation syndrome (SDRS).

Material and Methods

Thirty-one SDRS participants (male: 12 and female: 19) were recruited. All participants performed the SURS pre- and post-CD. The CD is performed on the participants in supine position, with 10 seconds of decompression followed by 5 seconds of rest, for a total duration of 10 minutes. Following this, strength is measured again in the post-CD. The examiner fixed the spinous process at the C4 level with the index finger of one hand while applying superior-direction traction to the C2 level spinous process using the index finger of the other hand. The force grade is based on the Maitland concept, using Grade 4, with careful monitoring to ensure the procedure is pain-free throughout. SURS was measured in the sitting position using a SMART KMEA strength sensor. The scapula was then fixed to the floor using an orthopedic belt. At this time, the angle between the fixed part of the ground and the fixed part of the shoulder was set to 45 degrees so that the resistance acts in the SUR direction, not the scapular elevation direction. The measurement was performed in the scapular upward rotation direction through isometric contraction. If SDR were present on both sides, the more severe side was selected. The significance of the difference between the two conditions was assessed using a paired t-test, with the level of statistical significance set at 0.05

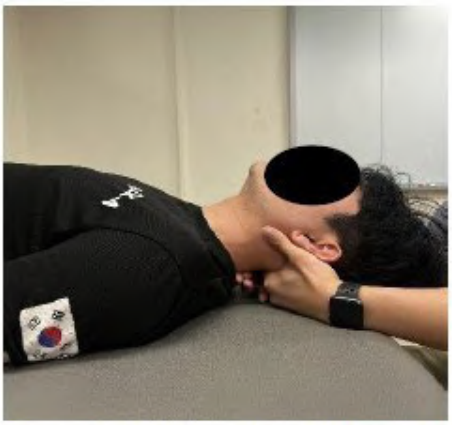

Figure 1. Cervical decompression at the C2-C4 segments

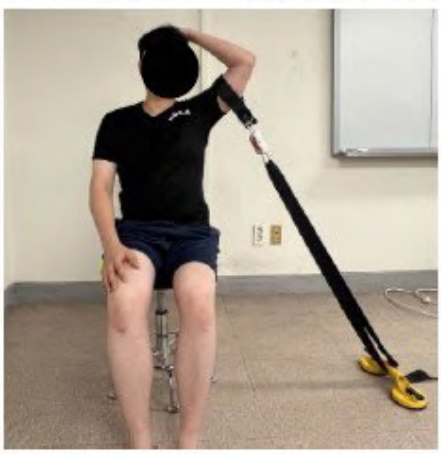

Figure 2. scapular upward rotator strength measurement

Results

The data collected for all variables were normally distributed. The results of the paired *t*-test revealed significant differences between pre- and post-CD measures, indicating that the CD increased the scapular upward rotator strength (from 0.113±0.032 to 0.141±0.047) (p<0.05).

Conclusion

CD at C2-C4 segments is effective on SURS in individuals with SDRS.

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FEATURES OF 1,25(OH)2D3 METABOLISM DURING PREGNANCY

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Objective. Study of the features of 1,25(OH)2D3 metabolism in pregnant women with gestational diabetes mellitus (GDM) in comparison with a control group of healthy pregnant women.

Material and Methods:
Two groups of patients participated in the study. Group 1 - pregnant patients with GDM (n=34) aged 18 to 45 years at a gestational age of 24-28 weeks (second trimester) and 30-38 weeks (third trimester), group 2 - healthy pregnant women (n=24) aged 18 to 45 years at a gestational age of 24-28 weeks and 30-38 weeks, who had their blood sampled for total calcium, albumin, parathyroid hormone (PTH) by immunochemiluminescent analysis and for total 25(OH)D and 1,25(OH)2D3 by high-performance liquid chromatography with mass spectrometric detection (HPLC-MS/MS).
Results:
The following results were obtained in group 1 in the in the second trimester: albumin-adjusted calcium - 2.25 mmol/l [2.21; 2.74], PTH– 29.74 pg/ml [22.29; 38.19], total 25(OH)D – 30.25 ng/ml [15.0; 43.5], 1,25(OH)2D3 – 32.87 pg/ml [21.70; 57.00]; in the third trimester: albumin-adjusted calcium – 2.27 mmol/l [2.23; 2.30], PTH- 27.79 pg/ml [22.62; 39.80], total 25(OH)D – 32.95 ng/ml [25.1; 40.4], 1,25(OH)2D3 – 42.95 pg/ml [34.46; 65.00]. In group 2: in the second trimester: albumin-adjusted calcium - 2.24 mmol/l [2.21; 2.33], PTH- 22.75 pg/ml [17.735; 31.90], total 25(OH)D - 46.95 ng/ml [35.2; 50.8], 1,25(OH)2D3 - 52.10 pg/ml [40.34; 68.66]; in the third trimester: albumin-adjusted calcium - 2.25 mmol/l [2.22; 2.32], PTH- 25.20 pg/ml [20.30; 32.41], total 25(OH)D - 42.65 ng/ml [33.75; 51.65], 1,25(OH)2D3 – 70.44 pg/ml [47.70; 87.35]. According to the specified parameters, statistically significantly higher levels were obtained in the healthy group for total 25(OH)D both in the second trimester (p= 0.001) and in the third trimester (p=0.018). The ratio of metabolites 1,25(OH)D3/25(OH)D3, reflecting the activity of 1-alpha-hydroxylase, in the second trimester was 1.59 [1.00; 2.36] vs. 1.39 [1.05; 1.62] (p = 0.463); in the third trimester – 1.39 [1.02; 1.94] vs. 1.86 [1.35; 2.07] (p = 0.252) for groups 1 and 2, respectively. When comparing and dynamically monitoring the total 25(OH)D and the ratio of metabolites 1,25(OH)D3/25(OH)D in the second trimester vs in the third trimester, it was found that in group 1 (GDM), respectively p = 0.059 and p = 0.607; in group 2 p= 0.838 and p= 0.025.
Conclusions:
The data obtained indicate that in the third trimester of pregnancy in healthy patients, the activity of 1α-hydroxylase increases, which increases the level of 1,25(OH)2D3 in the blood, which may be associated with initially higher values of total 25(OH)D compared to pregnant women with GDM. The results of the study indirectly confirm the contribution of vitamin D to the development of GDM.

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METABOLISM OF VITAMIN D DURING PREGNANCY

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Objective.
Study of the features of vitamin D metabolism and their relationship with the main complications of pregnancy and the features of calcium-phosphorus metabolism.
Materials and Methods:
Vitamin D metabolism was assessed in a 24-year-old patient with gestational diabetes mellitus (GDM) at 24 weeks of gestation, in the absence of cholecalciferol supplementation. The vitamin D metabolites were obtained via HPLC-MS/MS (DEQAS sertified).
Results:
The following results were obtained: pronounced deficiency of total 25(OH)D — 3.0 ng/ml (reference range: 20.0–60.0), 3-epi-25(0H)D3 — 0.8 ng/ml (1.0–10.0), 24,25(OH)2D3 – 0.1 ng/ml (0.5–5.6), 25(OH)D3/24,25(OH)2D3–25.0 (7.0–25.0), 1,25(OH)2D3 – 15.0 pg/ml (18.00–78.00). Despite these findings, the patient demonstrated normal levels of parathyroid hormone (PTH) – 33.06 pg/ml (15–65), phosphorus –1.02 mmol/l (0.74–1.52), normocalcemia (total calcium–2.34 mmol/l (2.15–2.55), albumin–38.3 g/l (35–50), albumin-corrected calcium — 2.37 mmol/l. The patient also had a normal body mass index (BMI = 24 kg/m2) before pregnancy.
Conclusions:
This clinical case highlights a potential relationship between GDM and the development of vitamin D deficiency, which may lead to impaired calcitriol (1,25(OH)2D3) activation despite normal PTH levels. The findings suggest that PTH-related peptide may play a significant role in vitamin D regulation during pregnancy. Further investigation into the relationship between 1,25(OH)2D3 and 25(OH)D levels during pregnancy is essential for advancing our understanding of vitamin D metabolism and its impact on optimizing maternal and fetal health outcomes.

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SUCCESSFUL CONSERVATIVE MANAGEMENT OF PRIMARY HYPERPARATHYROIDISM

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Background: Primary hyperparathyroidism is a multi-faceted disease with multiple causes. It may be due to a solitary adenoma of the parathyroid glands or multiple adenomas or to hyperplasia of the parathyroids. The disease may be therapeutically managed via multiple ways. It may be managed surgically by surgical excision of the parathyroid adenoma or the multiple adenomas. It may also be managed conservatively as surgical management may not be indicated in the case of parathyroid hyperplasia or in cases in which surgery is not feasible. The disease causes osteoporosis. Osteoporosis is one of the main clinical manifestations of primary hyperparathyroidism. Osteoporosis may be managed by the administration of bisphosphonates, in particular alendronate.
Objectives: The aim of the study was to describe the successful management of osteoporosis in the context of primary hyperpara-

thyroidism with alendronate in the effervescent form.
Methods: In a group of 15 patients, 12 female and 3 male, with primary hyperparathyroidism, aged 51-75 years osteoporosis was managed by the administration of alendronate in the effervescent form. Patients had primary hyperparathyroidism due to a solitary adenoma in 12 cases, to primary hyperplasia in 2 cases and relapsed primary hyperparathyroidism after surgical excision of an adenoma in 1 case. Patients presented with osteoporosis, T score ranging from -2.5 to -3.6. Alendronate 70 mg/wk in the effervescent form was administered for a period ranging from 6 months to 4 years. In all patients blood Ca, P and PTH were followed up. Bone mineral density was measured yearly.
Results: In all patients with primary hyperparathyroidism a significant improvement in bone mineral density was noted ($p<0.001$). In 12 of the patients T score improved and was in the range of osteopenia. No significant adverse events were noted.
Conclusion: It appears that primary hyperparathyroidism may be managed conservatively by the administration of bisphosphonates, in particular alendronate in the effervescent form, if surgery is not indicated or is not feasible. In these cases alendronate may improve osteoporosis, a main clinical manifestation of primary hyperparathyroidism, which, if left untreated may lead to fractures and disability.

P642

THE RELATIONSHIP BETWEEN PAIN, MUSCLE STRENGTH AND FUNCTIONAL PERFORMANCE IN PATIENTS WITH KNEE OSTEOARTHRITIS

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Objective: To assess pain, muscle strength and functional performance in knee osteoarthritis patients and to verify the correlation between these parameters.
Methods: 55 patients (61.4±3.2 years, 28 men and 27 women) diagnosed with knee steoarthritis based on the ACR criteria were included in this cross-sectional study. Pain was quantified on the visual analogue scale (SAV). Knee extensor strength was evaluated by the isokinetic method at the angular velocity of 120°/s, using a Gymnex Iso 2 Dynamometer. Timed up-and-go (TUG) test, chair rising test (CRT) and 6-minute walk (6MW) test were used to assess functional performance. Analyses of the relationship between pain, muscle strength and functional performance parameters was based on Pearson's correlation coefficients, with significance set at $p<0.05$.
Results: Pain score on SAV negatively correlated with CRT ($r=-0.211$, $p<0.05$) and 6MW test ($r=-0.225$, $p<0.05$), and positively with TUG score ($r=0.397$, $p<0.05$). Knee extensor strength positively correlated with CRT ($r=0.477$, $p<0.05$) and 6MW test ($r=0.482$, $p<0.05$), and negatively with TUG score ($r=-0.324$, $p<0.05$). Knee extensor strength negatively correlated with pain score on SAV ($r=-0.273$, $p<0.05$).
Conclusion: Muscle strength not only correlated with functional performance, but also significantly influenced pain in patients with knee osteoarthritis. Therefore, muscle training should be emphasized in the rehabilitation programs, in order to improve functionality and to alleviate pain.

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EFFECT OF NON-STEROIDAL ANTI-INFLAMMATORY DRUGS ON HIP JOINT DAMAGE IN AXIAL SPONDYLOARTHRITIS

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Objective: Coxitis is one of the most common causes of early disability in patients with axial spondylitis (axSpA). Currently, coxitis is detected in a significant number of patients with ankylosing spondylitis (AS). Mild axSpA is almost never seen in cases of hip joint (HJ) damage. Thus, the aim of this study was to evaluate the effectiveness of non-steroidal anti-inflammatory drug (NSAID) therapy in patients with axSpA and coxitis.
Methods: 25 patients (19 men and 6 women) with axSpA who had been observed for at least 2 years and had been taking NSAIDs on a regular basis were selected. All patients, regardless of complaints, underwent X-ray examination, ultrasound and magnetic resonance imaging (MRI) of the hip joints (HJ). Coxitis on HJ ultrasound was defined as an increase in the neck-capsular distance (NCD) of more than 7 mm and the presence of asymmetry between the joints of more than 1.5 mm. Coxitis on MRI was defined as the presence of synovitis and/or osteitis. The BASRI hip index was assessed for each HJ, and its increase to stage 2 and higher was considered X-ray coxitis. The average age was 31.1±7.0 years with an average disease duration of 74.52±100.1 months. HLA-B27 was positive in 23 (92%) patients.
Results: A comparative analysis of clinical, laboratory and instrumental parameters of the disease was conducted during a 2-year follow-up. At inclusion in the study, MRI signs of coxitis were detected in 25 (100%), after two years only 15 (60%) ($p<0.05$). Against the background of constant intake of NSAIDs, the number of MRI detected synovitis decreased from 25 (100%) to 13 (52%) ($p<0.05$). However, a reliable increase in radiographic coxitis was also obtained, at inclusion BASRI hip ≥2 was detected in 1 (4%), and after two years in 9 (36%) patients ($p<0.05$). The median SCR at the time of inclusion was 6.8 mm, and after two years it decreased to 6.2 mm ($p>0.05$). Other clinical activity indicators such as BASDAI, BASFI, ASDAS CRP, ESR and CRP also decreased, but no reliable difference was obtained between them ($p>0.05$).
Conclusion: Regular use of NSAIDs in most cases allows to reduce the amount of effusion in the hip joint according to MRI data, however, therapy does not affect the radiographic progression of coxitis.

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ANALYSIS OF PREVALENCE, GENDER AND AGE DIFFERENCES IN OSTEOPOROTIC BONE FRACTURES

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Objective: Systemic osteoporosis (OP) plays a leading role in the occurrence of bone fractures due to falls from one's own height. Among all injuries in osteoporosis, fractures of the proximal femur and humerus, compression fractures of the vertebral bodies, and distal radius are the most common. All of them lead to a significant decrease in the quality of life of patients, their disability, and death. An important area of research is the study of the prevalence, gender, and age differences in bone fractures in the population in order to develop an early prevention system and identify high-risk groups for osteoporotic fractures. Therefore, the aim of the study was to analyze the prevalence, gender, and age differences in patients with osteoporotic bone fractures.
Methods: 597 patients with osteoporotic bone fractures were examined: anamnesis of life was collected, comprehensive clinical, laboratory and instrumental examination was performed. Statistical analysis was performed using the Statistics 12.0 software package.
Results: The 597 patients had the following distribution by fracture localization: in 1st place, 424 (71%) patients were hospitalized with femoral neck fractures; in 2nd place, 142 (23.8%) patients were hospitalized with vertebral compression fractures; in 3rd place, 31 (5.2%) patients were hospitalized with radius fractures. During the gender analysis, we found that out of the total number of 597 patients examined, 329 (55.1%) were women and 268 (44.9%) were men. A more detailed analysis by nosology revealed that among patients with femoral neck fractures, there were 157 men (37.1%) and 267 women (62.9%). Among patients with vertebral compression fractures, there were 95 men (66.9%) and 47 women (33.1%). Among patients with distal radius metaphysis fractures, there were 13 men (41.9%) and 18 women (58.1%). The average age of men with femoral neck fractures was 64.9 years, while that of women was 78.1 years. The average age of women with vertebral compression fractures was 49.3 years, while the average age of men was 42.6 years. The average age of men with distal radius metaphysis fractures was 52.8 years, while that of women was 53.2 years. Among all 597 patients included in the study, 44 (7.4%) patients had a history of fractures of the bones of the extremities and spine. Moreover, the time after the previous fractures ranged from 3 years, 3 months and to 4 years.
Conclusion: In the structure of osteoporotic fractures, femoral neck fracture was significantly more common ($p<0.005$) than compression fractures of the vertebrae and fractures of the distal metaepiphysis of the radius. Osteoporotic fractures in total, as well as fractures of the femoral neck and fractures of the distal metaepiphysis of the radius, were significantly more common ($p<0.005$) in women than in men. Compression fractures of the vertebrae were significantly more common ($p<0.005$) in men than in women. Episodes of repeated fractures of the bones of the extremities and spine (3-4 years before the current fracture) were established only in 7.4% of patients. Among male patients, osteoporotic fractures occurred at a younger age than in female patients, which requires a detailed study and analysis of other risk factors for osteoporosis and chronic diseases.

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MEDICAL REHABILITATION OF A POSTMENOPAUSAL WOMAN AFTER RECONSTRUCTIVE SURGERY FOR FEMORAL NECK FRACTURE USING VIRTUAL REALITY TECHNOLOGIES AND ROBOTIC MECHANOTHERAPY: THE CLINICAL CASE

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Background. Rehabilitation after reconstructive surgeries for lower limb injuries combined with osteoporosis is important, as trauma ranks fifth among medical and social problems that harm health and lead to the death of the working population.
Objective: to describe our experience of rehabilitation a woman with postmenopausal osteoporosis after total hip arthroplasty due to a femoral neck fracture using virtual reality, robotic mechanotherapy with biological feedback (BFB) and physiotherapy.
Description of the clinical case. In 04/24 a woman S. with postmenopausal osteoporosis, 54 y.o., have been rehabilitated after left hip arthroplasty on 14/02/24. She complained of limited movement in the operated joint (flexion 110°), impaired weight-bearing ability of the left lower limb, need for support while walking, and limitations in self-care. According to X-ray, the position of the prosthesis was satisfactory. Results by the Harris scale – 46 pt, performed the "Get Up and Go" test in 16 s. According to biomechanical assessment of the joint using isokinetic dynamometry on a robotic complex with BFB, Max extension strength was 45.3 N, and Max flexion strength was 45.1 N. Walking speed measured on a sensory treadmill-ergometer was 21 steps per min, with a step length of 0.8 m. DXA showed a T-score in the L1-L4 at -2.8, in the right femoral neck -3.1 and in the total hip -2.8.
The rehabilitation program consisted of sessions in a virtual reality system with projections on the floor (25 min, №12), robotic mechanotherapy on an interactive sensory treadmill-ergometer C-Mill (25 min, №15), therapeutic exercises in the gym (30 min, №15), laser therapy on the operated area in pulse mode (power 20 W, infrared range 80 Hz, №15), magnetic field exposure on lower limb muscles (35 mT, №15), and therapeutic baths (10-15 min, 36-37°C, 30-35 g/L, №9).
Results after completing rehabilitation over 18 days: There was an increase in the volume of active pain-free movements in the

joint - flexion to 90º, transition to using a cane while walking, improvement in weight-bearing ability of the left leg, and significant improvement in self-care skills. The "Get Up and Go" test result was 13 s. Max extension strength was 57.0 N, and Max flexion strength was 47.6 N. Walking speed increased to 50 steps per min, with a step length of 1.04 m.
Conclusion. This case demonstrates the possibilities of a comprehensive rehabilitation program using virtual reality technologies and robotic mechanotherapy with BFB for a woman with postmenopausal osteoporosis after reconstructive surgery for a femoral neck fracture.

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CORRELATION OF CLINICAL FEATURES OF SYSTEMIC LUPUS ERYTHEMATOSUS AND OSTEOPOROSIS

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Objective: The main goal was to detect correlation between clinical features and occurrence of osteoporosis (OSP) in sytemis lupus erythematosus (SLE).
Material and methods: The 50 SEL patients were included in the study. The demographics, antibodies and laboratory parameters were collected. All collected variables were compared with the presence of OSP.
Results: The mean age was 47.48±12.93, disease duration 10.46±7.72 years and there was 48 (96%) female patients. In this group, there were 3 (6%) smokers, 2 (4%) diabetics and 4 (8%) patients had lupus nephritis. On corticosteroids treatment were 38 (76%) and on hydroxychloroquine 40 (80%). Eighteen (36%) patients had positive anti-Ro antibodies and 26 (52%) anti-dsDNA. Total cholesterol were 6.0±0.95 and LDL 3.92±1.12. OSP had 10 (20%) patients. There were statisticaly significant correlation between osteoporosis and: age ($p<0.01$), disease duration ($p<0.01$), total cholesterol ($p=0.04$) and LDL ($p=0.05$). The correlation between osteoporosis with the presence of anti-Ro antibodies was statistically significant ($p=0.02$), but with anti-dsDNA not ($p=0.29$). Correlations with other variables were not statistically significant.
Conclusion: The correlation between the occurrence of OSP and age, as well as the duration of the disease, is well known. The relationship of hypercholesterolemia and OSP indicates metabolic activity that includes bone tissue itself. Statistically significant correlation with anti-Ro antibodies specify the importance of the antibody profile in bone metabolism in SLE. We need larger studies to definitively prove this relationship.

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POLYPHARMACY AND VITAMIN D LEVELS IN HIP FRACTURED ELDERLY PATIENTS WITH AND WITHOUT DIABETES MELLITUS TYPE 2

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Objectives: This study aims to evaluate the impact of polypharmacy on vitamin D (VD) levels in hip-fractured elderly patients with and without diabetes mellitus type 2 (T2DM).
Material and Methods: We retrospectively studied 114 elderly patients (> 65 years old) with osteoporotic hip fractures, treated between January 2021 and January 2022. The non-diabetic group consisted of 49 patients, while the diabetes group included 65 subjects. 11 patients were newly diagnosed with impaired hemoglobin A1C (HbA1C) and switched to the diabetic group. 4 out of 11 patients were diagnosed with T2DM, and 7/11 had prediabetes. We recorded the number of medications, and polypharmacy was defined as four or more drugs. The 25-hydroxy vitamin D (25OH Vit D) was measured using an automated enzymatic immunoassay.
Results: The mean value of medications in the non-diabetic group (Group A) was 4,39 ± 2,71 standard deviation, while in the diabetic group (Group B), it was 6,31 ± 2,70. As it was expected, the diabetic group consumed more drugs, and the difference was statistically significant as the p-value was < 0,001. Polypharmacy was recorded in 59,2% of Group A patients, while only 13,8% of Group B patients received up to three medications. This difference was also statistically significant with p-value < 0,001. Inductive analysis was performed to evaluate the impact of polypharmacy on VD levels. In Group A, the difference of VD values (10,58 ± 5,61 ng/ml with polypharmacy vs 9,23 ± 5,19 ng/ml without polypharmacy) wasn't statistically significant (p-value 0,399). In contrast, in Group B patients, VD values differ statistically significantly. Patients with polypharmacy had a mean value of VD 10,56 ± 5,16 ng/ml, while those without polypharmacy had 6,56 ± 2,99 ng/ml. This difference is statistically significant as the p-value was to be 0,028. Regression analysis revealed that patients with polypharmacy are expected to have 2,603 higher levels of VD (95% CI: 0.357 – 4.849).
Conclusions: Our study revealed a paradox of increased VD levels among hip fractured diabetic patients with polypharmacy. Diabetic patients with more medications probably have better glycemic control and, consequently, higher VD levels. Our study has the limitation of not recording the type of medication, and more studies are necessary to evaluate the abovementioned conclusions. Clinicians should be aware that polypharmacy and psychotropic drug intake are associated with more unstable hip fractures, se-

vere VD deficiency, and increased levels of PTH. Steroids (such as prednisone), cholesterol-lowering drugs (such as cholestyramine and colestipol), seizure-preventing drugs (such as phenobarbital and phenytoin), and rifampin are directly correlated with lower VD levels.

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HIP FRACTURE SEVERITY IN ELDERLY PATIENTS WITH AND WITHOUT DIABETES MELLITUS TYPE 2

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Objectives: This study aims to record the severity of hip fractures in elderly patients with and without diabetes mellitus type 2 (T2DM).
Material and Methods: We retrospectively studied 114 elderly patients (> 65 years old) with osteoporotic hip fractures, treated between January 2021 and January 2022. The non-diabetic group consisted of 49 patients, while the diabetes group included 65. 11 patients were newly diagnosed with impaired hemoglobin A1C (HbA1C) and switched to the diabetic group. 4 out of 11 patients were diagnosed with T2DM, and 7/11 had prediabetes. The hip fractures were categorized as extracapsular (intertrochanteric) or intracapsular (sub-capital). Severe sub-capital fractures were defined as grades 3 or 4 according to the Garden classification. In contrast, severe intertrochanteric fractures were defined as grades A2.2, A2.3, and all A3 fractures according to the AO/OTA classification.
Results: Group A had 30 (61,2%) extra-capsular fractures and 19 (38,8%) intracapsular fractures, while their counterparts had 44 (67,7%) extra-capsular and 21 (32,3%) intracapsular fractures without any statistical significance (p= 0,474, χ^2 test). The difference in hip fracture severity between the two groups wasn't significant (p=0,344), although people with diabetes suffered more frequently from unstable fractures (75,4% versus 67,3%). More comminuted fractures were noted in patients on oral antidiabetic medications alongside insulin and with less than five years of antidiabetic therapy.
Conclusions: Unstable and severe comminuted hip fractures are linked to higher mortality rates and poorer functional status. Notably, the functional status before the injury is the only independent predictor of long-term functional outcomes and mortality. Our study corroborated that diabetic patients are more prone to experience displaced hip fractures. Interestingly, while diabetic patients generally correlate with higher bone mineral density (BMD), this observation presents a paradox that clinicians should be aware of BMD alone is not a reliable measure of bone quality in diabetic patients, necessitating additional diagnostic tools.

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VD LEVELS IN ELDERLY PATIENTS WITH AND WITHOUT DIABETES MELLITUS TYPE 2

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Objectives: This study aims to record vitamin D (VD) levels in elderly patients with and without diabetes mellitus type 2 (T2DM).
Material and Methods: We retrospectively studied 114 elderly patients (> 65 years old) with osteoporotic hip fractures, treated between January 2021 and January 2022. The non-diabetic group (group A) comprised 49 patients, while the diabetes group (group B) included 65 patients. 11 patients were newly diagnosed with impaired hemoglobin A1C (HbA1C) and switched to the diabetic group. 4 out of 11 patients were diagnosed with T2DM, and 7/11 had prediabetes. An automated enzymatic immunoassay measured 25-hydroxy vitamin D (25OH Vit D).
Results: VD values were similar in both groups (10,03 ± 5,43 ng/mL in group A versus 10,01 ± 5,09 ng/mL in group B), without any statistical significance (p=0,986, Pearson equation). Severe vitamin D deficiency was more prevalent in Group A, affecting 29 patients (59.2%), compared to Group B, which affected 37 patients (56.9%). Notably, none of the patients in either group had normal vitamin D levels.
Conclusions: Despite differences in glycemic status, the participants shared several characteristics that contributed to these results regarding vitamin D levels. All patients were elderly with minimal sun exposure and age-related skin changes. Additionally, liver and kidney function, which are often impaired in elderly patients, negatively impact the synthesis of vitamin D. Poor nutrition, characterized by low serum albumin levels and the fact that food and milk in Greece are not adequately fortified with vitamin D, further exacerbates vitamin D deficiency.

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PARATHORMONE LEVELS IN DIABETIC AND NON-DIABETIC ELDERLY PATIENTS WITH LOW ENERGY HIP FRACTURE

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Objectives: This study aims to identify if there is any difference in parathormone levels between diabetic and non-diabetic elderly patients with hip fractures.
Material and Methods: We retrospectively studied 114 elderly patients (>65 years old) with low-energy hip fractures, with and without a history of diabetes mellitus type 2, which were treated in our department during the last two years between January 2021 and January 2023. We measured the values of 25 OH vitamin D (VD), parathormone (PTH), and glomerular filtration rate (eGFR). Secondary hyperparathyroidism (SHPT) was defined if PTH levels exceeded 65 pg/ml. The diabetic group consisted of 65 patients, and their counterparts were 49. Patients with chronic kidney disease (CKD) grades 4 and 5 were excluded from the study because severe renal failure results in reduced synthesis of calcitriol and secondary hyperparathyroidism.
Results: VD levels were similar in both groups (10,03 ± 5,43 g/dL non-diabetic vs 10,01 ± 5,09 g/dL diabetic) without any statistically significant difference (p=0,986). PTH levels differ significantly between the two groups (p= 0,018). PTH levels in non-diabetic patients were 79,71 ± 57,6 pg/mL, while in diabetic patients, the values were 56,42 ± 45,57 pg/mL. The e GFR values were 72,14 ± 24,81 and 66,55 ± 21,43 for non-diabetic and diabetic patients, respectively. SHPT was more prevalent in non-diabetic patients (Group A) with 42,9% (21 patients) in comparison with diabetic subjects (Group B) with 24,6% (16 patients). This difference was statistically significant, as the p-value was 0,039. We performed further statistical analysis, and based on the Pearson equation, we found statistical significance when we correlated PTH and VD levels among participants of group A. The p-value was 0,014. Based on regression analysis, VD is expected to decrease by 0.029 for every unit increase in PTH concerning all the participants (95% CI: 0.011-0.048) and not only Group A patients.
Conclusions: Current studies show a direct suppressive effect of high glucose concentrations on PTH secretion, while higher PTH levels within the normal range may enhance beta-cell function. Human beta cells have been shown to express parathyroid hormone-1 receptors, supporting the correlation between PTH levels and beta-cell function. Recent experimental studies demonstrate regeneration following partial pancreatectomy, and administration of PTH-related peptides reinforces this relationship. A more straightforward explanation for the lower PTH levels in patients with T2DM could be that inflammation induced by hyperglycemia hinders PTH production. Additionally, diabetes-related microangiopathy might contribute to parathyroid gland dysfunction. The dysregulation of PTH due to hyperglycemia could play a role in this finding and warrants further investigation.

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THE LARGEST STUDY ON PRIMARY HYPERPARATHYROIDISM (LATVPHPT) AT RIGA EAST UNIVERSITY HOSPITAL, LATVIA: FOCUS ON OSTEOPOROSIS, OSTEOPENIA, AND BONE FRACTURES

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Background. Primary hyperparathyroidism (PHPT) can manifest with a variety of clinical symptoms, ranging from asymptomatic cases to those with significant involvement of multiple organs, including osteoporosis and osteopenia. The literature shows variability in the prevalence of organ involvement and related conditions.
Methods. This LATVPHPT study included 177 PHPT patients diagnosed between January 1, 2021, and January 1, 2024. Using IBM SPSS 29.0 software, we conducted a detailed retrospective analysis of medical records, laboratory data, radiologic findings, surgical outcomes, and histopathology reports.
Results. 177 patients (mean age 63.8±11.9 years), 89% were females. 65% (n=115) of patients underwent parathyroidectomy, 14.7% (n=26) had surgery postponed due to unknown adenoma location, 1.1% (n=2) declined, 19.2% (n=34) – awaiting surgery, 3 – needed reoperation due to negative histopathology. Hungry bone syndrome occurred in 3 patients. 2 patients had MEN1 syndrome. Histopathological analysis and imaging in patients who underwent surgery identified a single adenoma in 94.0% (n=106), double adenomas – 1.7% (n=2), hyperplasia – 2.6% (n=3), carcinoma – 1.7% (n=2). Among imaging modalities, contrast-enhanced ultrasonography (CEUS) showed superior performance for identifying typically localized adenomas compared to ultrasonography (b = −1.68, p = 0.020), scintigraphy (b = −1.70, p = 0.026), and 3D-CT (b = −1.66, p = 0.046). While SPECT/CT demonstrated a similar trend, the results did not reach statistical significance (b = −1.2, p = 0.099). The mean preoperative calcium was 2.9±0.3mmol/L, intact parathyroid hormone (iPTH) – 251.2±242.1pg/mL, phosphorus – 0.8±0.2mmol/L, 25-OH vitamin D – 27.6±13.3ng/mL. The mean postoperative calcium was 2.4±0.1mmol/L, iPTH – 59.9±36.5pg/mL, phosphorus – 1.1±0.2mmol/L, 25-OH vitamin D – 43.4±16.1ng/mL. Comorbid conditions were in 35% (n=62) had with osteoporosis, 54% (n=95) – osteopenia, 15% (n=26) – osteoporotic fractures. In 17.5% (n=31) of patients, PHPT was suspected and later confirmed only due to a prior diagnosis of osteoporosis or osteopenia based on DXA or QCT. 17.5% (n=31) of patients received oral bisphosphonates, 4.0% (n=7) – intrave-

nous bisphosphonates, 8.5% (n=15) – denosumab, 1.1% (n=2) – medication holidays. 25% (n=44) had kidney stones, 23% (n=41) – gallstones. 31.1% (n=55) of patients were asymptomatic PHPT based on retrospectively reviewed previous medical records. Thyroid conditions included thyroid nodules in 81% (n=143), nontoxic goitre in 53% (n=93), and autoimmune thyroiditis in 29% (n=51). Other associated conditions included hypertension 43% (n=76), type 2 diabetes 14% (n=24), and malignancies 20% (n=36), most commonly breast and thyroid cancers.
Conclusions. High rates of skeletal complications and malignancies in PHPT emphasize its clinical impact. Precise imaging, timely diagnosis, and appropriate treatment are essential for managing its complex manifestations. It is important to exclude the possibility of/rule out PHPT in patients with osteopenia and osteoporosis.

P653

THE EFFECTS OF TIBIA FRACTURE AND INTRAVENOUS STEM MESENCHYMAL CELLS AT DIFFERENT TIMES AFTER SURGERY ON MAXILLARY ALVEOLAR BONE LOSS

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Objective: Aim of the study is to test maxillary alveolar bone loss after tibia fracture modeling and intravenous injection of mesenchymal stem cells (MSC) at different times after surgery.
Material and Methods: 162 male rats with the body weight of 190-225 g were distributed into 7 groups: group 1 - controls, group 2 - animals with tibia fracture, and groups 3-7 for the animals with the same tibia fracture that received intravenous injections of 5 million MSC per injection at 3rd, 10th, 15th, 24th and 45th days after surgery. Bone marrow cells were obtained from the tibia and phenotyped according to standard methods. Upon expiration of observation terms (7, 15, 30, 60 and 90 days) the animals were withdrawn from the experiment. Measurements of linear distance (mm) between the cement-enamel junction (CEJ) and the alveolar bone crest (ABC) of the mesial root of the first molar were performed on the buccal and the palatal surfaces.
Results: In group 2 the buccal CEJ-ABC exceeded than that of the group 1 by 6.23%, 9.59%, 10.54%, and 5.16% in the period from the 15th to the 90th day and the palatal CEJ-ABC – by 5.80%, 6.21%, 12.17%, 9.72%, and 6.60% in the period from the 7th to the 90th day. In group 3 palatal CEJ-ABC was lowered than that of the group 2 by 6.42%, 5.69% and 5.16% in the period from the 30th to the 90th day, and on the buccal side by 30th and 60th day - by 5.11% and 6.21%. In group 4 the palatal CEJ-ABC was lowered than that of the group 2 by 6.07%, 8.85%, 7.07% and 7.08% in the period from the 15th to the 90th day, and on the buccal side by 4.63%, 6.71% and 8.64% in the period from the 15th to the 60th day. In the groups 5-7 the restoration maxillary alveolar bone were expressed to a significantly lesser extent.
Conclusion(s): Administration MSC into the defect of the tibia at different times after surgery was accompanied by a faster recovery of the maxillary alveolar bone. The most effective was administration of MSC on the 10th day after surgery.

P654

CONSEQUENCES OF FALLS IN ELDERLY

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Objective This study aimed to evaluate physical and psychological consequences among older adults living in the community.
Material and Methods People, aged 60 years and above, who attended the National Osteoporosis Center for diagnostic or treatment purposes, participated in interviews. According to these interviews, the outcomes and healthcare measures related to falls experienced in the previous 12 months were documented. There was used a specially prepared questionnaire for demographic and falls data, fear of falling questionnaire „Falls Efficacy Scale International"(FES-I) and physical activity questionnaire „Physical Activity Scale for the Elderly"(PASE).
Results The study population consisted of 972 community-dwelling elderly people (mean age 73.7±5.9 years). Falls were reported by 361 (37.14%) of respondents. One in three of the interviewed people had fallen two or more times in the period of one year. Most of all fallen elderlies reported various injuries and 79 (23.3%) of them experienced bone fractures. Fear of falling was reported by 272 (74.1%) respondents. Almost half (42.7%) of fallers restricted their everyday activities. The primary self-reported cause of restriction of everyday activities was identified as pain.
Conclusions Fear of falling was reported by 75.4% of respondents who experienced a fall in the past 12 months. Furthermore, all older adults who sustained hip or vertebral fractures subsequently restricted their daily activities.

P655

REFERENCE INTERVALS FOR SERUM CONCENTRATIONS OF OSTEOCALCIN FOR GREEK ADULT MEN AND WOMEN

I. Tryfonidi[1], P. Lukas[2], S. Tournis[3], C. Croupis[4], E. Vasiliadis[5], E. Cavalier[2], E. Chronopoulos[3], K. Makris[6]

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Background-Objective: Bone turnover markers (BTMs) reflect the metabolic activity of bone tissue and can be used to monitor osteoporosis therapy. To adequately interpret BTMs, method-specific and population specific reference intervals are needed. We aimed to determine reference intervals (RI) for serum concentrations of Osteocalcin (OC) for the Greek adult population.
Methods: We collected samples from 431 apparently healthy Greeks (142 men, 150 pre- and 139 postmenopausal women), who volunteered to participate in our study. Data on socio-demographic characteristics, medical histories and medications were collected and subjects with clinical conditions or receiving medications affecting bone metabolism were excluded. Dual-energy X-ray absorptiometry (DXA) was used to measure bone mineral density (BMD) in all participants. All blood collections were performed in the morning after overnight fast. Serum OC concentrations were measured by an automated immunoassay on the IDS-iSYS analyzer (Immunodiagnostic Systems, Boldon, UK). The RI was defined as the central 95% range and determined according to CLSI guideline C28-A3 and using the MedCalc Software.
Results: The mean ages of men, pre- and post-menopausal women were 50.7, 40.7 and 58.4 years respectively. DXA results revealed that 348 participants had normal BMD, 73 were osteopenic, while 10 who had osteoporosis were excluded from analysis. Since our data were not normally distributed (Shapiro-Wilk test) in any group and we used the non-parametric method suggested by the CLSI guide in order to determine the RI. Subjects with osteopenia, regardless of sex, exhibited significantly higher values for OC compared to those with normal BMD [median (25.75 percentiles)] 16.78ng/mL (13.51-20.72) vs 20.06ng/mL (15.08-27.13). Post-menopausal women exhibited significantly higher values 18.42ng/mL(14.84-26.65) compared to pre-menopausal women 16.31ng/mL(12.47-20.42) and men 17.17ng/mL(13.59-21.11). Separate RI were calculated and suggested for subjects with normal BMD (8.67-39.2ng/mL), with osteopenia (8.37-48.01ng/mL) as well as for men (9.77-39.81ng/mL), pre-menopausal (7.62-35.12ng/mL) and postmenopausal women(10.52-50.24).
Conclusion: We provide RI for OC concentrations in serum for the Greek adult population using an automated immunoassay. Our data may aid to interpret bone turnover in the Greek adult population

P656

REFERENCE INTERVALS FOR SERUM CONCENTRATIONS OF TARTARATE RESISTANT ACID PHOSPHATASE 5B FOR GREEK ADULT MEN AND WOMEN

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Background-Objective: Bone turnover markers (BTMs) reflect the metabolic activity of bone tissue and can be used to monitor osteoporosis therapy. Tartrate-resistant acid phosphatase, isoform 5b (TRACP5b) is a bone resorption marker not influenced by renal function or food intake and can be measured in serum by immunoassays. We aimed to determine reference intervals (RI) for serum concentrations of TRACP5b for the Greek adult population.
Methods: We collected samples from 431 apparently healthy Greeks (142 men, 150 pre- and 139 post-menopausal women), who volunteered to participate in our study. Data on socio-demographic characteristics, medical histories and medications were collected and subjects with clinical conditions or receiving medications affecting bone metabolism were excluded. Dual-energy X-ray absorptiometry (DXA) was used to measure bone mineral density (BMD) in all participants. All blood collections were performed in the morning after overnight fast. Serum TRACP5b concentrations were measured by an automated immunoassay on the IDS-iSYS analyzer (Immunodiagnostic Systems,Boldon,UK). The RI was defined as the central 95% range and determined according to CLSI guideline C28-A3 and using the MedCalc Software.
Results: The mean ages of men, pre- and post-menopausal women were 50.7, 40.7 and 58.4 years respectively. DXA results revealed that 348 participants had normal BMD, 73 were osteopenic, while 10 who had osteoporosis were excluded from analysis. Since our data were not normally distributed (Shapiro-Wilk test) in any group, we used the non-parametric method suggested by the CLSI guideline in order to determine the RI. Subjects with osteopenia, regardless of sex, exhibited significantly higher values for TRACP5b compared to those with normal BMD [median (25.75 percentiles)] 3.22U/L (2.71-3.83) vs 2.41U/L (1.96-3.13). Post-menopausal women exhibited significantly higher values 3.19U/L(2.63-3.83) compared to pre-menopausal 2.19U/L(1.75-2.70) and men 2.48U/L(2.07-3.13). Separate RI are calculated and suggested for subjects with normal BMD (1.11-4.78U/L), with osteopenia (1.24-5.47U/L) as well as for men (1.38-4.61U/L), pre-menopausal (1.08-4.54U/L) and postmenopausal women(1.57-6.44U/L).
Conclusion: We provide RI for TRACP5b concentrations in serum for the Greek adult population using an automated immunoassay. Our data may aid to interpret bone turnover in the Greek adult population.

P657

IMPROVED COMPARABILITY OF B-ISOMERIZED C-TERMINAL TELOPEPTIDE OF TYPE I COLLAGEN (B-CTX-I) IMMUNOASSAYS

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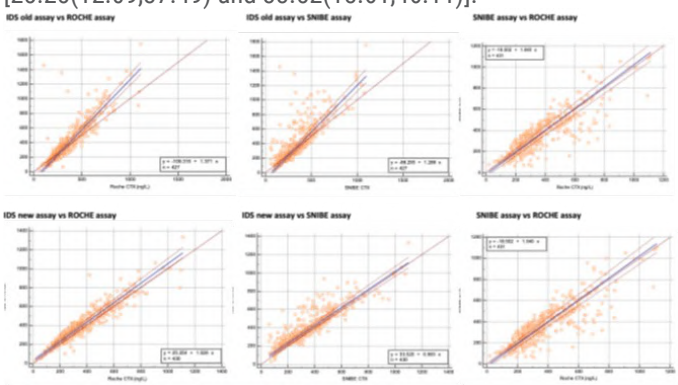
Background-Objective: β-CTX-I has been recommended as a reference marker for bone resorption in research studies. Studies have showed significant disagreement in patient results from existing commercial assays. Recently one IVD manufacturer (IDS) developed an new version of its assay claiming improved performance . We aim to evaluate the current status of harmonization of three commercial assays measuring β-CTX-I.

Methods: Serum samples from 431 subjects (348 healthy, 73 osteopenic and 10 osteoporotic patients) were collected in Athens, Greece and were tested in Athens and Liege, Belgium with three automated commercial assays (new- and old-IDS on ISYS, Roche on Cobas e-411 and SNIBE on Maglumi). All measurements were performed according to manufacturers instructions. Passing-Bablok regression was used to determine the agreement between results in methods comparison.

Results: The paired comparisons (figure) performed between the old-IDSvsRoche and vsSNIBE revealed significant differences as the regression equation 95%CI of intercept and slope do not include 0 [-109.31(-127.32,-91.99), -88.29(-110.03,-69.29)] and 1 [1,37(1.32,1.43), 1.28(1.22,1.36)] respectively. The comparison between the SNIBE and Roche show good agreement of these methods, since the 95%CI of the intercept included 1 [-18.50(-36.97,2.24)] and the slope 0 [1.04(0.98,1.09)]. The new-IDS assay showed significantly improved comparability with both Roche and SNIBE assays. The 95%CI of slope includes 1 in both compariosns [1.03(0.99,1.07) and 1.00(0.95,1.03)] and the intercept corresponds to limit of quantitation of the new-IDS assay [25.25(12.09,37.49) and 33.52(18.61,46.11)].



P658

CHARACTERIZATION OF OSTEOPOROSIS IN THE OLDEST OLD: DIAGNOSIS, TREATMENT, AND FUNCTIONALITY – REAL-WORLD EVIDENCE FROM COLOMBIA

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Objective:Todescribetheclinicalandtreatmentcharacteristicsofosteoporoticpatientsover80yearsinareal-worldscenarioinColombia. Material and Methods: This observational, retrospective study analyzed medical records of over 80-year-old with osteoporosis, treated by endocrinologists from 2022 to 2024. clinical, densitometric, and treatment data were collected using REDCap and analyzed using descriptive statistics (Excel & SPSS-27) Results: Among 211 patients, 92.4% were women ($\bar{x}$ 85.4, 80-103 years) vs men ($\bar{x}$ 84.9, 80-98) undergoing BMD evaluation. Women's BMI (24.8±4.1kg/m², range 16.65-40.79) was similar but more varied than men's BMI (23.3±3.7kg/m², range 17.97-31.23). 25.1% of participants had >4cm height loss and 11.8% smoked. Over half had fragility fractures (57%, N=120), with vertebral fractures being most common (35.5%, N=75), and 50% of these had two vertebral fractures. The mean T-score for the lumbar spine was -2.50±0.94; femoral neck -2.35 ±1.10; and total hip, -2.14±1.08. The distal radius had the lowest T-scores, even in repeated measurements (-3.51±1.73 in the second and -4.14±1.20 in the third). Most prescribed treatments were zoledronic acid (23.2%), denosumab (22.3%), alendronate (21.3%), and teriparatide (20.4%). Notably, 75.8% adhered to initial treatment. 85.3% received calcium and/or vitamin D. Therapeutic failure was 19.4% after initial treatment and 10.9% after the second. Second-line treatments included denosumab (26.1%) and teriparatide (10.0%). Reportedadverseeffectswereminimal,gastrointestinalintolerance (4.7%),flu-likesyndrome(2.4%)andmusculoskeletalpain(1.4%).No cases of atypical fractures, osteonecrosis, or uveitis were reported. 57.2% of patients had at least one frailty criterion, yet

over half were totally independent in daily activities, with only 5% showing moderate or severe dependence. 64% walked without support, but 25% had a fall in the past year. Conclusion: This real-world study of patients over 80 on osteoporosis treatment shows high adherence rates and minimal adverse effects. Addressing treatment failures and improving access to first-line anabolic therapies is critical for optimizing outcomes in this vulnerable population.

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IMPROVING BONE HEALTH IN A TERTIARY FRAGILITY FRACTURE CENTRE WITHOUT A DEDICATED FRACTURE LIAISON SERVICE

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Objective In 2019, Whipps Cross Hospital became the dedicated Fragility Fracture Centre for Barts Health Trust. Despite the lack of a specialist Fracture Liaison Service (FLS) recommended by national guidelines, the hospital's Older People's Services (OPS) has improved bone health practices through evaluation and implementation audit cycles.

Aim

- Assess 100% of OPS patients for fragility fracture risk.
- Offer secondary prevention to all identified at-risk patients.

Methods

A 2020 audit revealed high in-patient femoral fracture rates and insufficient risk assessments (21%). In 2021, the National Audit for Inpatient Falls (NAIF) highlighted the need for a Multifactorial Risk Assessment (MFRA). Initial data showed only 2% of at-risk patients received MFRAs, 4% bone health reviews, and 8% bone health treatments. A survey identified a lack of confidence among healthcare professionals in bone health management.

A multi-faceted plan was developed, including:

1. Comprehensive Geriatric Assessments incorporating MFRAs.
2. A bone health flowchart and discharge summary template.
3. A nurse-led bone health clinic.
4. Electronic referral forms.

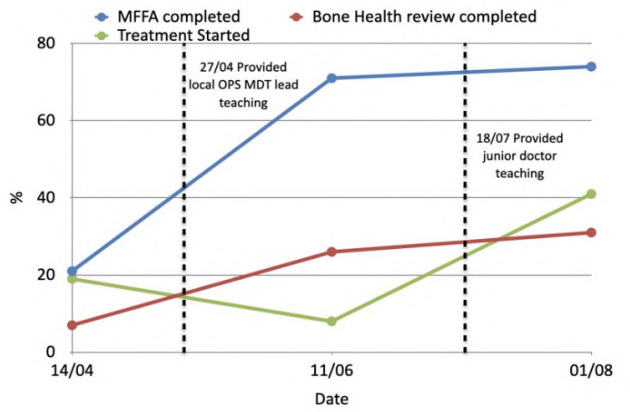
Training programs targeted knowledge gaps among Emergency Department practitioners, OPS clinicians, and trainees in Geriatric Services and General Practice.

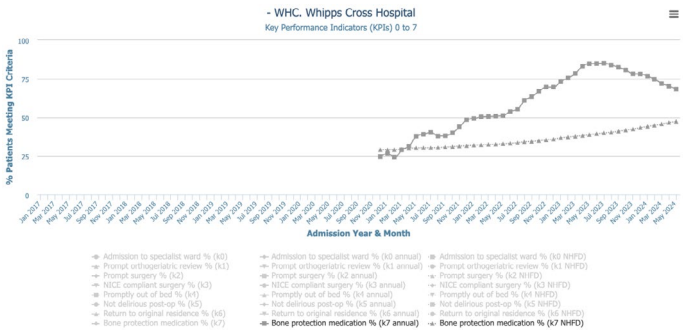
Results Re-audits demonstrated:

- Increased bone health assessments to 99.3%.
- A rise in prescribing anti-resorptive medications, from 11 in 2019 to 864 in 2023, with improved drug selection (e.g., romosozumab).
- Enhanced patient engagement: 94% received counseling, and 84% reported confidence in understanding osteoporosis.

Conclusion

Through iterative audits and education, Whipps Cross achieved near-complete bone health assessments and significantly improved prescribing practices without a dedicated FLS. Patient outcomes, staff knowledge, and satisfaction have improved, reducing fragility fractures. Future goals include sustaining progress and addressing identified gaps.





Bone Protection Stock Adjustment List for WXH Dispensary from 01-Jan-2019 to 31-Dec-2023

	2018	2019	2020	2021	2022	2023
Zol		2 (geri) 1 (orthogeri) 3 (Rheum)	1 (geri) 0 (orthogeri) 0 (Rheum)	10 (Geri) 6 (orthogeri) 0 (Rheum)	330 (geri) 197 (orthogeri) 37 (Rheum)	247 (geri) 202 (orthogeri) 59(Rheum)
Rom		-	-	-	-	Approved for Romo- 49 Number receiving treatment-31 Number completed treatment- 7
Den o		O (geri) 8 (orthogeri) 55 (Rheum)	1 (geri) 4 (orthogeri) 199 (Rheum)	5 (geri) 22 (orthogeri) 105 (Rheum)	113 (geri) 86 (orthogeri) 193 (Rheum)	220 (geri) 157 (orthogeri) 123 (Rheum)

Name	Code	Received falls assessment^	Received bone health assessment^
Whipps Cross Hospital	WHC	99.3	99.3
All NHFD		95.7	93.9

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POSTMENOPAUSAL WOMEN WITH LOW-TRAUMA FRACTURES HAVE A HIGHER NUMBER OF CLINICAL RISK FACTORS

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OBJECTIVES: FRAX is the recommended method for risk assessment in almost all world guidelines. It has its advantages and disadvantages. In the absence of precise strategies, individuals are identified with an individual approach strategy based on the previous existence of a low trauma fracture or the existence of significant risk factors[1].
AIM: To investigate the difference between subgroups of subjects with and without fractures in relation to the number of clinical risk factors (RFs) mentioned in the FRAX.
METHODS: In this cross-sectional study, data were collected related to fractures and RFs. The research included 515 female respondents aged 45-70 years. In data analysis χ^2 test is used.
RESULTS: Subjects with a previous fracture due to minor trauma had at least one RF present (100%) and more than half had ³3 RFs, while 10% without fracture had ³3 RFs. The highest percentage of respondents with fractures (52.6%) had ³3 RFs, while the highest percentage of women without fractures had 1 FR (47.4%) (χ^2=190,07,df=3, p=0,000). Women with a spinal fracture had: ³3 RFs - 58.0%, 2 RFs - 36%, while subjects without fractures had 1 RF - 37%(χ^2=90,70, df=3, p=0,000). Women with non-vertebral fractures had ³3 RFs- 52.9%, while the highest percentage without fractures had 1 RF -39.4% (χ^2=103,45, df=3, p=0,000). Women with hip fractures had ³3 RFs -61.3%, while without fractures have 1 (31.6%) or 2 RFs (31.0%)(χ^2=21,06, df=3, p=0,000). Women with forearm fracture had: ³3 RFs- 51.2%, 2 RFs (41.5%), while without fractures had 1 RF (34.4%) (χ^2=46,02, df=3, p=0,000). Women with upper arm fractures had ³3 RFs - 56%, while without fractures had 1 (31.2%) or 2 RFs(30.8%) (χ^2=13,53, df=3, p=0,004). Women with other fractures (52.7%) had ³3 RFs, while without fractures had 1 (32.8%) or 2 RFs (30%) (χ^2=29,99, df=3, p=0,000).
CONCLUSION: More than half of the respondents with a fracture due to minor trauma had 3 or more RFs. In daily work, it is important to actively search for individuals with RFs for the best possible selection for treatment and prevention of the first and subsequent fractures.

[1]Aleksic J, Zvekic-Svorcan J, Vujasinovic Stupar N, Jeremic I, Grgurevic A. Cross-cultural validation of the Modified Falls Efficacy Scale in Serbian community-dwelling women at risk for osteoporotic fracture. Menopause. 2018 Apr;25(4):444-450.

P661

TELEHEALTH-DELIVERED CIRCUIT TRAINING: A NON-INFERIOR APPROACH TO REDUCING INTERMUSCULAR FAT IN KNEE OSTEOARTHRITIS PATIENTS

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Objective
To investigate whether a periodized circuit training program delivered via telehealth is as effective as the same protocol delivered face-to-face in reducing thigh intermuscular adipose tissue (IMAT) in adults with knee osteoarthritis (OA).
Material and Methods
This randomized controlled trial included 100 adults aged 40 years or older with radiographic evidence of knee OA (grades II or III, Kellgren and Lawrence scale). Participants were assigned to one of two groups: (1) Face-to-Face (FtF), which involved presential, supervised periodized circuit training; or (2) Telehealth, where the same protocol was delivered asynchronously via online videos, DVDs, or YouTube, combined with periodic phone calls from a physical therapist. IMAT was quantified using computed tomography scans (Multislice Brilliance CT 16-slice, Philips) at baseline and after 14 weeks. Tissue composition analysis was conducted using ITK-SNAP software, with attenuation rates indicating fat presence. An intention-to-treat (ITT) and a per-protocol (PP) analysis were conducted using mixed-effects models to compare group (FtF vs. Telehealth) and time (baseline vs. 14 weeks) effects on IMAT.
Results
A total of 100 participants (mean age 54 ± 8 years, 60% female, BMI 27 ± 2.5 kg/m²) completed the trial, with similar baseline characteristics between the FtF (n=50) and Telehealth (n=50) groups. Baseline IMAT values were comparable (FtF = 13.7 cm², Telehealth = 13.3 cm²). Both groups showed significant reductions in IMAT after 14 weeks: FtF group mean decreases of 1.6 cm² (PP) and 1.5 cm² (ITT), and Telehealth group mean decreases of 1.5 cm² (PP) and 1.1 cm² (ITT). Mixed-effects models confirmed that the telehealth approach was not inferior to face-to-face training.
Conclusion
Periodized circuit training delivered via telehealth is as effective as face-to-face delivery in reducing IMAT depots in adults with knee OA. This finding supports the adoption of telehealth as a viable, cost-effective approach to reduce IMAT and improve outcomes for patients with knee OA, while addressing barriers such as physical distance and healthcare costs.

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IMPACT OF OBESITY ON PAIN AND FUNCTION IN KNEE OSTEOARTHRITIS: A CROSS-SECTIONAL STUDY

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Objective

To investigate the relationships between body composition, physical activity, knee pain, and functional status in patients with knee osteoarthritis (KOA), with a particular focus on differences between obese and non-obese individuals. Additionally, the study aimed to explore these associations in obese KOA patients to identify potential targets for intervention.

Material and Methods

This cross-sectional study was conducted in São Carlos, São Paulo, Brazil, between January 2023 and October 2024, including 86 participants aged 40 years or older with symptomatic KOA. Participants were categorized into two groups—obese and non-obese—based on body mass index (BMI), with obesity defined as BMI ≥ 30 kg/m². Primary outcomes included knee pain assessed using the Western Ontario and McMaster Universities Osteoarthritis Index-pain (WOMAC-P) scale. Secondary outcomes included functional status measured via the WOMAC-function (WOMAC-F) scale and the 40m Fast Paced Walk Test (40m FPWT). Statistical analyses included t-tests and multiple linear regression models to evaluate the relationships among body composition, physical activity, and knee pain/function across obesity statuses. Body composition parameters such as fat mass index (FMI) and fat percentage were included in the models to explore their associations with outcomes.

Results

Of the 86 participants (median age: 58 years, range: 40–87; 64% female), obese individuals (n=44) reported significantly greater knee pain compared to non-obese participants ($p<0.05$). Additionally, obese participants exhibited significantly lower walking speed than their non-obese counterparts ($p<0.05$). Among obese participants, higher body fat percentage was positively associated with worse functional status, as measured by WOMAC-F scores (β=0.32; 95% CI: 0.01–0.36), though it showed no association with WOMAC-P scores or 40m FPWT velocity. Similarly, FMI was positively associated with WOMAC-F scores (β=0.29; 95% CI: 0.00–0.17) but was not linked to WOMAC-P or 40m FPWT outcomes in obese participants.

Conclusion

Obese individuals with knee osteoarthritis experience greater knee pain and slower walking speeds compared to non-obese individuals. In obese participants, higher body fat percentage and fat mass index are associated with worse functional outcomes, as reflected in higher WOMAC-F scores. These findings emphasize the importance of targeted interventions focusing on body composition and physical activity for obese patients with KOA.

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NF-KB SIGNALING PATHWAY-BASED RESEARCH OF ANTAGONISM BETWEEN VASPIN AND LEPTIN IN OSTEOARTHRITIS

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Abstract :

Leptin and visceral adipose tissue-derived serine protease inhibitor(Vaspin) both belonged to the adipokines family. They were closely related to the pathophysiology of osteoarthritis (OA). Our studies showed that leptin plays a catabolic role on articular cartilage. Recently, we demonstrated that the vaspin levels were markedly decreased in patients with OA, and vaspin prevented the inflammation and degradation of chondrocytes, which closely related to the NF-κB signaling pathway. Besides, our pre-experiment studies demonstrated vaspin suppress leptin-induced degradation on chondrocytes, while the current mechanism was still absent. We speculate that the antagonism and imbalance between vaspin and leptin may play an important role during the pathophysiology of OA. In the present study, we will inspect the metabolism induced by vaspin and leptin in chondrocytes and also inflammatory and angiogenesis in synovial tissues, and find out the antagonism role between vaspin and leptin. We will assess the effects of vaspin and leptin on the NF-κB signaling pathway changes and find out related mechanisms. Through the animal model with intra-articular injection, we will find out the precise antagonism role between these two adipokines. This project will explore the role of antagonism between adipokines during the pathophysiology of OA.

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COMPARISON OF EARLY CURATIVE EFFECTS OF LATERAL UNICOMPARTMENTAL KNEE ARTHROPLASTY WITH TOTAL KNEE ARTHROPLASTY AND THE LEGACY CONSTRAINED CONDYLAR KNEE ARTHROPLASTY IN THE TREATMENT OF ISOLATED LATERAL OSTEOARTHRITIS: A SINGLE-CENTER RETROSPECTIVE STUDY

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Background: Aims of this study were to compare the functional and radiographic results, perioperative complication after lateral unicompartmental knee arthroplasty (LUKA) with total knee arthroplasty (TKA) and the legacy constrained condylar knee (LCCK) arthroplasty for the treatment of lateral compartmental knee osteoarthritis (LCKOA), and to provide a basis for the treatment of LCKOA.

Methods: From January 2021 to January 2024, analyzed retrospectively clinical data of 74 patients with LCKOA treated with

LUKA, TKA and LCCK arthroplasty. According to the operation plan, the patients were divided into three groups: LUKA group (23 cases), TKA group (23 cases) and LCCK group (28 cases). The changes of hip-knee-ankle (HKA) angle of the affected knee before and after operation were measured. All patients were assessed using the operation time, blood loss during operation, incision length, visual analogue scale (VAS) score before operation and after operation, Hospital for Special Surgery score (HSS), Oxford Knee Score (OKS), range of motion (ROM).
Results: All 74 patients were followed up for (2.38±0.33) years. The operation time, blood loss during operation, incision length and VAS score after operation in the LUKA group were significantly less than those in the TKA group and LCCK group (P<0.05); HKA valgus angle, ROM, HSS score and OKS score of the three groups after operation were significantly better than those before operation (P<0.05); There was no significant difference among the three groups in HSS score and OKS score (P>0.05).
Conclusion: To sum up, LUKA, TKA and LCCK prosthesis for the treatment of LCKOA have good clinical effects; Compared with TKA and LCCK prosthesis, LUKA has the advantages of less trauma, less bleeding, less pain and quick recovery, but the indications and contraindications of surgery should be strictly evaluated, and the short-term effect is satisfactory, while the long-term effect remains to be observed.

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SYNERGIZING ADAPTIVE IMMUNITY AND REGENERATIVE SIGNALS TO ENHANCE OSTEOCHONDRAL DEFECTS REPAIR

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Abstract :
In clinical practice, repairing osteochondral defects (OCDs) is challenging because of the complex cartilage/subchondral bone structure and intricate immunological microenvironment. Here, we identify the crucial role of adaptive immunity dysfunction by revealing that an increase of T helper 17 (Th17) cells exacerbated osteochondral tissue degradation via its pro-inflammatory cytokine interleukin-17 (IL-17) in the early-stage OCDs. Next, we leveraged this adaptive immunity mechanism and combined it with regenerative signals to develop a multifunctional hydrogel system capable of simultaneously tackling immune dysfunction and regenerative deficiency. Rapid IL-4 release from the methacrylated hyaluronic acid (HAMA) hydrogel exerts a potent immunomodulatory effect by inhibiting the differentiation and function of Th17 cells. Moreover, transforming growth factor-beta1 anchored on methacrylated hyaluronic acid and heparin (HAMA@HepMA) microparticles provides sustained regenerative signals, which synergistically transform the pro-inflammatory microenvironment into a pro-regenerative niche for enhanced OCDs healing. Our study suggests that targeting specific immune pathways can significantly enhance the efficacy of regenerative strategies, paving the way for innovative treatments in orthopedic medicine.

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THE EFFECTS OF SHORT-TERM DIETARY ENERGY RESTRICTION WITH OR WITHOUT EXERCISE ON INFLAMMATION AND JOINT PAIN IN PATIENTS WITH KNEE OSTEOARTHRITIS

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Objectives: There is limited research on the effects of short-term caloric restriction and exercise on systemic inflammation and clinical outcomes in knee osteoarthritis. The objective of this study is to determine the effects of 4-weeks dietary energy restriction alone (D only) or combined with aerobic exercise (D+E) on systemic inflammation and index knee pain in overweight and obese individuals with knee osteoarthritis.
Material and Methods: Twenty-three individuals with knee osteoarthritis completed this trial. Participants randomised to the D group (n= 9, BMI = 30.0±2.4 kg.m^2, Age = 56±5 years) were asked to reduce their habitual energy intake by 5,000kcal per week for 4 weeks, and those randomised to the D+E group (n= 14, BMI = 32.3±4.8 kg.m^2, Age = 57±5 years) were asked to follow the same dietary energy restriction and perform five, 30-minute bouts of moderate intensity cycle ergometer exercise per week. Blood samples and Visual Analogue Scale pain ratings were collected at baseline, after a 4-week control period and following the 4-week intervention period. Data are presented as mean ± SD.
Results: C-Reactive Protein (CRP) remained relatively high but was unchanged in both groups post-intervention (D, 3.07±3.91 mg/L; D+E, 2.28±2.03 mg/L). An interaction effect was present for IL-6, which decreased (p<0.01) and was lower post-intervention in the D+E group (1.47±0.70 mg/L) compared to D (2.71±1.31 mg/L). VAS index knee pain was reduced in both groups (p<0.01), but to a greater extent in the D+E group.
Conclusions: Four weeks of dietary energy restriction reduces index knee pain in obese individuals with knee osteoarthritis. When combined with regular bouts of moderate intensity aerobic exercise, dietary energy restriction leads to greater reductions in knee pain and some biomarkers of systemic inflammation.
Disclosures: This research was sponsored Versus Arthritis as part of the National Centre for Sport Exercise and Osteoarthritis Research.

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OPPORTUNISTIC IDENTIFICATION OF VERTEBRAL FRACTURES ON CT BY ARTIFICIAL INTELLIGENCE; DOES IT SAVE EXPERT PHYSICIAN TIME?

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Objective

To determine the accuracy of Nanox-AI HealthVCF in identifying Vertebral Fractures (VF) and whether physician time is saved. The ADOPT study is evaluating the patient and economic outcomes of VF detection on CT scans using artificial intelligence (AI) enabled Fracture Liaison Service identification (FLS).

Material and Methods

In a single hospital centre, CT scans of adults aged 50 and over were analysed by Nanox-AI HealthVCF and then re-read by expert physicians with experience in identifying VF using the grade 2/3 semi-quantitative Genant score. Three re-reading of CT scans were conducted, dated October 2017, October 2023 and October 2024.

Results

In 2017, a total of 484 scans were analysed by the AI with 143(29.5%) flagged to contain VF and of these, 45(31.4%) confirmed by the expert. 983 scans in 2023 had 392(39.8%) AI VF flagged and of these, 68(17.3%) confirmed by experts. In 2024, a total of 1201 scans were analysed with 497(41.4%) AI VF flagged, 86(17.3%) confirmed by the experts.

Conclusion

Between 17.3% – 31.4%% of scans flagged by the AI were confirmed to have a VF. This equates to 1730 - 3140 VF per 10,000 CT scans. The variability between 2017 and 2023/24 indicates the value of post market surveillance and clinical confirmation.

Experts agreed with similar proportions of AI flagged scans between 2023 and 2024. Due to limitations with commencing the AI, not all scans from October 2017 were analysed, which may account for the larger proportion of positive scans. Nevertheless, due to the AI experts had to review significantly less CT than the total number of raw scans, saving time in identifying VF. AI enabled FLS could provide a time effective way to identify potential treatment appropriate patients.

Disclosures

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THE OSTEOPOROSIS TREATMENT GAP IN IRELAND: REALITY OR ECOLOGIC FALLACY?

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Objective: The treatment gap for osteoporosis represents the disparity between individuals who require treatment and those who receive it. A European report indicates this gap is 32% in Ireland; however, our findings suggest a different outcome. We conducted an investigation into the treatment gap among Irish men and women.

Materials and Methods: We analyzed treatment rates among patients from a previously characterized cohort in the West of Ireland, known as The DXA HIP Project, following appropriate ethical approval. The development, validation, and clinical characteristics of this cohort have been published. We compared the use of calcium and vitamin D, as well as osteoporosis medications (including bisphosphonates, denosumab, estrogen, raloxifene, and teriparatide), between two groups: those referred for a DXA scan and those who completed a DXA scan. Participants were categorized into three risk groups based on treatment criteria: low risk (none), moderate risk (at least one), and high risk (two or more).

Results: Data were available for analysis from 978 patients (28%) in the referral group and 2,090 in the post-scan group. Within the referral group, 271 individuals had a previous fracture, while 707 did not. Calcium and vitamin D were prescribed to 48% of those with a prior fracture compared to 45% of those without, while osteoporosis medications were prescribed to 30% of the former and 35% of the latter. The majority of individuals in the post-DXA group were prescribed calcium and vitamin D, regardless of their risk status, as detailed in the table below. Conversely, a significant majority of at-risk men and women did not receive osteoporosis medications. Notably, fewer than one in three men and one in two women categorized as high risk were provided with appropriate therapy.

Conclusions: The actual treatment gap for osteoporosis in Ireland remains unacceptably wide. The prevalence of unnecessary treatments among those at low risk has contributed to a misleading perception that the issue is minimal (ecologic fallacy). Further efforts are essential to comprehend and enhance the factors con-

tributing to ineffective prescribing practices.

Variable		Low Risk	Intermediate Risk	High Risk
Calcium and Vitamin D	Men	60%	48%	58%
	Women	53%	48%	70%
Osteoporosis Medication	Men	21%	21%	31%
	Women	16%	28%	46%
Both	Men	17%	16%	22%
	Women	14%	23%	37%

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A COMPARISON OF OSTEOPOROSIS INTERVENTION THRESHOLDS: A DATA-DRIVEN ANALYSIS

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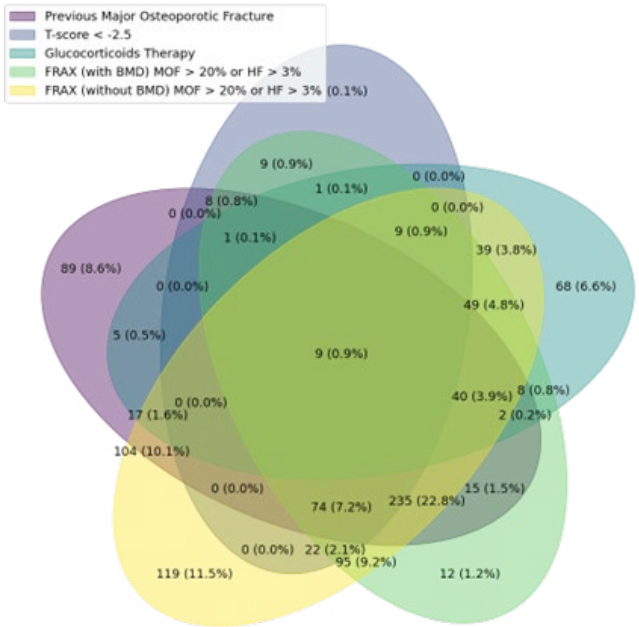
Background: Clinical guidelines indicate that osteoporosis medication should be considered for individuals diagnosed with osteoporosis, those who have experienced a major osteoporotic fracture, patients on chronic glucocorticoid therapy, and individuals at high risk of fractures. However, many eligible patients remain untreated, making it essential to identify the most appropriate intervention criteria for osteoporosis treatment in order to optimize patient care and address the treatment gap.
Purpose: This study aims to compare the agreement between different intervention thresholds for osteoporosis treatment.
Methods: A validated subset of The DXA-HIP cohort, previously published, was utilized to evaluate five intervention thresholds: 1) Major Osteoporotic Fracture (MOF); 2) central DXA T-score ≤ -2.5; 3) chronic glucocorticoid therapy; 4) Irish FRAX® with BMD showing MOF ≥ 20% or Hip fracture (HF) ≥ 3%; and 5) Irish FRAX® without BMD indicating MOF ≥ 20% or HF ≥ 3%. The agreement among these thresholds was analyzed using Cohen's kappa coefficient, alongside a Venn diagram to illustrate the overlap between thresholds.
Results: A total of 1,254 adults aged 40–90 years participated: 290 men and 964 women, with a mean age of 69 years and a mean lowest T-score of -1.4. The FRAX® scores with BMD indicated a MOF risk of 13% and an HF risk of 4%.
Out of the participants, 220 (18%) did not meet any treatment criteria, while 1,025 (82%) met one or more criteria, and 9 (<1%) met all criteria. Significant variability was noted in the proportion of individuals considered eligible for treatment across different criteria: 48% based on prior MOF, 13% on T-score ≤ -2.5, 20% on glucocorticoid therapy, 46% for FRAX® with BMD, and 66% for FRAX® without BMD.
The Venn diagram presented below highlights considerable variability and overlap among different thresholds, with notable discrepancies particularly concerning patients on glucocorticoid therapy.
Agreement levels ranged from very poor (kappa: -0.15) to moderate (kappa: 0.48).
Conclusions: There is significant heterogeneity and inconsistency among various intervention thresholds for osteoporosis treatment, which may contribute to the observed differences in treatment rates. This finding emphasizes the need for the standardization of intervention thresholds to effectively address the osteoporosis treatment gap.



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MUSCLE ULTRASOUND AND PHYSICAL ASSESSMENT AS PART OF A COMPREHENSIVE FRAILTY EVALUATION IN HEMATO-ONCOLOGY PATIENTS: PILOT STUDY

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Frailty status significantly increases morbidity and mortality in allogeneic hematopoietic cell transplantation (allo-HCT). However, the role of physical function and muscle ultrasound evaluation remains unclear **Objective:** Evaluation of physical, muscle ultrasound, and functional parameters in the assessment of frailty in allo-HCT candidates
Material and Methods: A single-center, consecutive sampling study was conducted on allo-transplant candidates evaluated in the Rehabilitation Department. Frailty was evaluated using the HCT Frailty Scale. The physical assessment included morpho-functional parameters such as bioelectrical impedance, muscle ultrasound, one-minute sit to stand test (1-MSTST), grip strength

(GS), and validated questionnaires (DASI and IPAQ).
Results: 16 patients were included, with 56.3% females and 43.8% males. The mean age was 57.75yo (SD=14.15), with a BMI of 26.51kg/m² (SD=4.47), 28.21% body fat (SD=7.50), and 67.41% lean mass (SD=7.74). 50% were classified as fit and 50% as pre-frail. The average grip strength was 28.50kg (SD=9.91), and the 1-MSTST had a mean of 23 repetitions (SD=11.81). The mean DASI score was 40.95 (SD=14.73), and estimated weekly METs from the IPAQ were 3563.5 (SD=2400.51). No significant differences were found between frailty groups (p>0.05).
Significant correlations were observed between 1-MSTST performance and %lean mass (r=0.592, p=0.026), DASI scores (r=0.666, p=0.025), and weekly METs (r=0.784, p=0.003). Additionally, femoral rectus circumference significantly correlated with handgrip strength (r=0.612, p=0.012). No significant correlations were found with the TUG test.
Conclusion: In patients eligible for alloHCT, indicators such as lean mass percentage, 1-MSTS, grip strength, DASI, and IPAQ are valuable tools for assessing functional capacity. Additionally, ultrasound parameters, such as the circumference of the rectus femoris, show potential in the comprehensive approach. However, the small sample size and the lack of post-transplant follow-up limit the interpretation of this findings.

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ASSOCIATION BETWEEN 11-YEAR CHANGE OF TOTAL HIP BONE MINERAL DENSITY AND SARCOPENIA IN 500 POSTMENOPAUSAL WOMEN

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Background: Sarcopenia and osteoporosis are common conditions in aging populations, yet their interplay remains poorly understood. Sarcopenia, characterized by reduced muscle mass and strength, may contribute to bone loss and fracture risk through impaired mechanical loading and shared risk factors. We investigated the association between sarcopenia components and total hip bone mineral density (THBMD) changes in postmenopausal women in the FRISBEE cohort.
Methods: Five hundred elderly postmenopausal women, median age 77.4 (IQR 74.7-81.8) years, were followed during a median duration of 11 years for the occurrence of incident fractures. All subjects underwent evaluation of THBMD and appendicular lean mass index (ALMi) with DXA as well as handgrip strength and gait speed testing. Associations between these sarcopenia components and THBMD changes compared to baseline were examined using linear and logistic regression models, adjusted for clinical risk factors for fracture (CRFs).
Results: Higher handgrip strength, gait speed, and ALMi, as well as a dedicated treatment for osteoporosis (≥1 year in the preceding 10 years) and menopausal hormone therapy were significantly associated with lesser THBMD loss, while a sedentary lifestyle and a history of central fracture were linked to greater loss. Multivariate analysis identified low handgrip strength (<16 kg) as the only independent predictor of THBMD loss (adjusted OR=2.27; p<0.01), even after adjusting for confounders. Although ALMi and gait speed were significant variables in univariate analysis, they lost predictive value after adjustment.
Conclusions: We identified a significant association between sarcopenia components, particularly handgrip strength, and changes in THBMD after an 11-year period in a large cohort of elderly postmenopausal women. These findings suggest that a low handgrip strength should alert clinicians on possible BMD loss in the previous years, with a subsequent increased fracture risk.
Keywords: Fracture prediction; Bone loss; Sarcopenia; Osteosarcopenia; Grip strength.
Funding: Supported by CHU Brugmann, Brugmann Foundation, and IRIS-Recherche.
Disclosures: No conflicts of interest were declared.

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FRACTURE PATIENTS WHO ARE INFORMAL CAREGIVERS EXPERIENCE CHALLENGES IN MANAGING THEIR BONE HEALTH

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Objective: Our objective was to examine the experience of bone health management in fragility fracture patients who were also serving as informal caregivers at the time of fracture.
Material and Methods: A phenomenological study was conducted. Eligible patients were English-speaking males and females, 45+ years old with a fragility fracture who 1) presented as outpatients to the fracture clinic at an urban hospital or as inpatients to a rehabilitation hospital in Toronto, Canada, and 2) reported that they were informally caring (not paid) for at least one family member, friend or person in the community on a regular basis at the time of their fracture. Patients were interviewed (60-90 minutes) within six months of the fracture in their homes or by telephone, and one year later (30-60 minutes) by telephone. Analysis was guided by Giorgi's procedures.
Results: We interviewed 25 patients (22 females, 3 males) aged 50-83 years old. This sample size met sample size requirements for phenomenological studies*. Participants reported that caregiving was prioritized over fracture recovery and managing bone health. Participants described the fracture as adding to the burden of being a caregiver both emotionally and physically. After the

fracture, participants reported that their caregiving responsibilities were temporarily put on hold, reduced or modified, depending on the severity of the fracture and the needs of the care recipient. They often had to make alternative arrangements for care recipients during the time they were admitted to hospital or recovering at home. The fracture was a reminder of participant's own fragility and the importance of staying well so they could maintain the health of their care recipient.

Conclusions: Our results suggest that fracture patients who are caregivers experience challenges in continuing the caregiving role as well as looking after their own health. It is important that patients have access to supports that will relieve their caregiver burden so that they can focus on fracture recovery and bone health.

Reference: *Giorgi. The theory, practice, and evaluation of the phenomenological method as a qualitative research procedure. J Phenomenol Psychol 1997;28:235-60

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P673

PROVISION OF MEDICATION PRESCRIPTION IN A FRACTURE LIAISON SERVICE DID NOT DIMINISH DURING COVID

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Objective: Our objective was to examine the impact of COVID on medication prescription in Ontario's Fracture Screening and Prevention Program (FSPP), after adjusting for fracture risk status and equity-related variables.

Material and Methods: We conducted a logistic regression analysis in a province-wide Fracture Liaison Service (the FSPP) with medication prescription as the outcome. Medication prescription was defined as a prescription for pharmacotherapy by either a bone health specialist or primary care provider. Covariates in the model included COVID time periods (T1 - April 2019 to March 2020: "pre-COVID" (n=2796); T2 - April 2020 to March 2021: "during COVID" (n=1575); T3 - April 2021 to March 2022: "COVID recovery" (n=2208)), fracture risk status (high risk versus not high risk) and equity-related variables (sex, age, marital status, living arrangement, education status, geographic location, and presence of comorbidities). Goodness of fit was assessed with the area under the receiver operating characteristic curve (AUC) and the Hosmer and Lemeshow test.

Results: Fracture risk status was the primary driver of treatment prescription with high risk patients eight times more likely to receive a medication prescription compared to patients who were not high risk for future fracture, after adjusting for all covariates (Odds Ratio = 8.01 [95% CI 7.09, 9.05]). COVID time period was not statistically significant. Of the equity-related variables, female patients, those who were married or in a common-law relationship, lived alone, or resided in urban areas were more likely to be prescribed medication. The model had adequate prediction power and fit the data well (AUC: 0.77; Hosmer and Lemeshow test P-value: 0.23).

Conclusions: We did not observe a significant association between COVID time periods and medication prescription after adjusting for all potential confounders. Fracture risk status, sex, marital status, living arrangement, and geographic location were significantly associated with medication prescription.

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SETTING FLS TARGETS FOR PHARMACOTHERAPY IN FRAGILITY FRACTURES OF THE HIP, SHOULDER AND WRIST

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Objective: Our objective was to develop Fracture Liaison Service (FLS) targets for pharmacotherapy in patients with a fragility fracture of the hip, shoulder, and wrist.

Material and Methods: From January 2011 to September 2021, 3846 fracture patients were identified by an FLS in a Level 1 Trauma Centre in Toronto, Canada. Of these, 1425 patients 50+ years old presented with a fragility fracture of the hip, shoulder or wrist (659 hip; 273 shoulder; 493 wrist), were not on pharmacotherapy for bone health, and had a femoral neck T-score available if not automatically considered high risk for future fracture. According to the prevailing 2010 Canadian clinical practice guidelines* (and consistent with the updated 2023 guidelines), all patients with a hip fracture (n=659), 130 patients with a shoulder fracture, and 156 patients with a wrist fracture were indicated for pharmacotherapy. Data on contraindications to pharmacotherapy (gastrointestinal, renal impairment, liver failure, allergy or intolerance to bisphosphonates) were collected as well as other reasons to consider not prescribing medication to this population (age>90 years; end of life; end-stage cancer; mental health or social circumstances; severe dementia; death).

Results: Of patients indicated for pharmacotherapy, 84.4% of hip, 90.8% of shoulder, and 95.5% of wrist fracture patients should have been prescribed medication as they did not have any contraindications to pharmacotherapy. Other reasons for not prescribing medication were found in hip fracture patients only and reduced the pharmacotherapy target for hip fractures to 68.8%.

Conclusions: Based on contraindications alone, treatment targets for hip, shoulder and wrist fracture patients indicated for pharmacotherapy ranged from 84.4% to 95.5%. Additional reasons for not prescribing pharmacotherapy reduced the target to 68.8% for hip fracture patients, indicating the medical complexity of this population.

Reference: *Papaioannou et al. CMAJ 2010;182:1864-73.

Disclosures: Authors report no conflicts of interest.

P675

THE COMPLIANCE CHALLENGE: MIND THE GAP WITH IV BISPHOSPHONATES

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Objective
To assess compliance with oral bisphosphonates in patients admitted with fragility fractures of the femur at Kettering General Hospital.
Neck of femur (NOF) fractures are associated with significant morbidity and mortality in older adults. Bisphosphonates are critical for reducing future fracture risk. This study evaluates compliance with oral bisphosphonates 120 days post-fracture, as per National Hip Fracture Database (NHFD) KPI-7. Johansen et al (2023) recommended intravenous zoledronic acid (IV Zol) as the first-line treatment for fragility hip fractures due to its cost-effectiveness and ability to reduce re-fracture risk within six months, aligning with National Osteoporosis Guideline Group (NOGG) guidelines.
Method
A retrospective review included patients aged 60 and over admitted with NOF fractures (July–September 2024). Data from NHFD and PAS was collected, excluding deceased and end-of-life patients. Key data points included initiation of bisphosphonates during admission, reasons for non-initiation, and the type prescribed (oral vs. IV). Follow-up interviews assessed compliance and satisfaction for patients on oral bisphosphonates.
Results
Of 97 eligible patients, 49 were started on bisphosphonates during admission: 20 on oral bisphosphonates and 29 on IV bisphosphonate. Five were already on treatment (3 on alendronic acid). Reasons for non-initiation included referral to the Osteoporosis Clinic (26), renal impairment at baseline (9), renal impairment as inpatient (2), poor dentition (2), and poor prognosis (1).
At 120 days, 14 of 19 respondents (71%) on oral bisphosphonates reported compliance, but 11 (58%) experienced issues with treatment.
Conclusions
This study reveals suboptimal compliance with oral bisphosphonates and supports IV bisphosphonate as a superior first-line therapy for fragility fractures, consistent with the Five Nations Consensus. This study has signified the importance of patient education in raising awareness of bone health.

P676

PLATELET-RICH PLASMA INJECTIONS FOR LUMBAR DEGENERATIVE MONODISCOPATHY: A PILOT STUDY

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Objective:
This longitudinal pilot study aimed to evaluate the feasibility, safety, and potential benefits of platelet-rich plasma (PRP) injections into lumbar intervertebral discs in patients with chronic low back pain and degenerative monodiscopathy, assessing potential efficacy on disability.
Material and Methods:
Six participants with chronic low back pain and lumbar degenerative intervertebral disc disease underwent a single PRP injection into the affected lumbar intervertebral disc. Follow-up assessments were conducted over 1 year. Outcomes included the Roland Morris Disability Questionnaire (RMDQ) for disability, numeric rating scale (NRS) for pain, Tampa Scale for Kinesiophobia (TSK), and lumbar flexion range of motion. Magnetic resonance imaging (MRI) was used to evaluate disc structural changes.
Results:
No adverse events were reported. At 1 year, 50% of participants showed significant improvements in disability scores (RMDQ), while the remaining 50% experienced no change. Pain (NRS) and kinesiophobia (TSK) scores showed no consistent pattern of improvement across the cohort. MRI analysis revealed no significant changes in intervertebral disc morphology.
Conclusion:
PRP injections may offer potential benefits for selected patients with degenerative lumbar intervertebral discopathy and low back pain, particularly in reducing disability. However, the findings are limited by the small sample size and absence of a control group. Further research with larger, randomized controlled trials is needed to establish efficacy and optimize PRP therapy protocols for this population.
References:
Kaux JF, Demoulin C, Ferrara MA, Fontaine R, Grosdent S, Bethlen S, Tomasella M, Gillet P, Vanderthommen M. EXPLORING THE FEASIBILITY OF PLATELET-RICH PLASMA INJECTIONS FOR INTERVERTEBRAL DISCOPATHY: A PILOT STUDY. J Rehabil Med Clin Commun. 2024 Oct 16;7:18305.
Disclosures:
This study was supported by a grant from the Leon Fredericq Foundation.

P677

UNCONTROLLED ASTHMA: ASSOCIATIONS WITH ALTERED BODY COMPOSITION, REDUCED EXERCISE CAPACITY, AND MENTAL HEALTH IMPLICATIONS

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Objective:
This study aimed to evaluate the relationship between body composition, inflammatory phenotypes, and exercise capacity in patients with uncontrolled asthma, focusing on the impact of fat and lean mass on lung function and patient-reported outcomes.
Material and Methods:
Fifty-six patients with moderate-to-severe uncontrolled asthma and 14 healthy controls were recruited. Dual-energy X-ray absorptiometry (DXA) was used to assess body composition, including fat mass, lean mass, and bone mineral content. Inflammatory phenotypes were determined using induced sputum and fractional exhaled nitric oxide (FeNO). Exercise capacity was measured via VO_2 max, and spirometry evaluated lung function. Patient-reported outcomes included asthma control (ACT), quality of life (AQLQ), and mental health (HAD).
Results:
Asthmatics exhibited higher body mass index (BMI), fat mass index (FMI), and visceral adipose tissue (VAT) compared to controls ($p<0.0001$). Lean mass was lower in asthmatics ($p=0.0012$) and correlated with better asthma control, reduced depression scores, and improved lung function. Eosinophilic asthma was associated with lower fat mass and superior exercise tolerance compared to non-eosinophilic asthma (VO_2 max: 20.7 vs 17.3 mL/min/kg, $p=0.04$). Increased fat mass correlated with restrictive lung patterns and higher systemic inflammatory biomarkers (CRP and fibrinogen).
Conclusion:
Uncontrolled asthma is associated with significant alterations in body composition, including increased fat mass and reduced lean mass, which impact lung function, exercise tolerance, and mental health. Eosinophilic asthma demonstrates a favorable phenotype with lower fat mass and improved exercise capacity. Interventions focusing on nutritional support and physical rehabilitation may enhance disease management and patient outcomes.
References:
Schleich F, Ziant S, Louis S, Moermans C, Deroisy R, Louis R, Kaux JF, Bury T. Uncontrolled asthma is Associated with Increased Visceral Adipose Tissue, Decreased Bone Mineral Content, and Reduced Exercise Capacity. J Asthma Allergy. 2024 Dec 31;17:1369-1382.

P678

CLINICAL ASSESSMENT OF PURESSENTIEL® MUSCLES AND JOINTS GEL AROMATHERAPY IN THE MANAGEMENT OF OSTEOARTHRITIS-RELATED KNEE PAIN

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Introduction : Knee osteoarthritis (OA) is a degenerative joint disease that affects millions globally, causing chronic pain and limited mobility. Pharmacological treatments for OA-related knee pain come with risks, making alternative or complementary therapies attractive. This post-market trial evaluates the efficacy of Puressentiel® Muscles and Joints gel, an aromatherapy gel with 14 essential oils, in managing OA-related knee pain.
Method : In this 12-week open-label trial (NCT04736563), participants aged 45–90 with OA-related knee pain applied Puressentiel® Muscles and Joints gel twice daily for 4 weeks, following a 4-week run-in period without treatment. Pain, joint stiffness, and function were assessed using the Western Ontario McMaster Universities Arthritis Index (WOMAC) and Visual Analog Scale (VAS) at baseline, 4 weeks, 8 weeks, and 12 weeks, and oral analgesic intake was recorded daily.
Results : Significant improvements in WOMAC and VAS scores were observed during treatment ($p = 0.0262$; $p < 0.0001$, respectively) and sustained 4 weeks post-treatment ($p = 0.0190$; $p < 0.0001$, respectively). Paracetamol intake significantly decreased from baseline to the end of treatment ($p = 0.0230$), though anti-inflammatory intake did not change significantly. No adverse events were reported.
Conclusion : Puressentiel® Muscles and Joints gel was well-tolerated, improved WOMAC and VAS scores, and reduced paracetamol use, presenting a viable natural option for pain management in knee OA.
Conflicts of Interest: P.C., T.M., and F.L. received funding from Puressentiel® to perform the trial. The funders had no role in the design of the trial, in the collection, analysis, or interpretation of the data; in the writing of the manuscript; nor in the decision to publish the results.

P679

CURRENT PRACTICES AND CHALLENGES IN PERIPROSTHETIC BMD ASSESSMENT: TOWARDS STANDARDIZATION

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Periprosthetic bone mineral density (pBMD) assessment is essential in optimizing outcomes for arthroplasty patients. However, inconsistencies in dual-energy X-ray absorptiometry (DXA) protocols, region of interest (ROI) placement, and analysis techniques limit precision, reproducibility, and the development of standardized, evidence-based guidelines.

Objectives: To evaluate the variability in DXA protocols for pBMD assessment as reported in the literature and clinical practice and to estimate the impact of this variability on pBMD measurements.

Material and Methods: An extensive review of the published literature was conducted, focusing on:

1. Variability in pBMD acquisition and analysis protocols reported in the literature, including ROI placement, DXA machine settings, and post-processing software.
2. The variability in pBMD evolution in clinical trials, when protocol details were available.
3. Estimating the impact of protocol differences on pBMD measurements by analyzing a patient dataset and simulating changes in pBMD measurement based on the factors identified in the reviewed studies.

Results: There was substantial variability in pBMD measurement, with differences of up to 24% between pBMD protocols. The most significant contributors to variability were related to:

- Inconsistent ROI placement, especially at the bone-prosthesis interface.
- Differences in software algorithms, particularly edge detection and ROI definition.
- Patient positioning (e.g., rotation and flexion) during DXA scans.

Many studies did not fully report the protocols used for pBMD assessment, further complicating reproducibility and cross-study comparisons. Protocol inconsistencies between studies were frequent when reported, particularly in ROI definitions.

Conclusions: The study highlights a pressing need for standardized DXA protocols in periprosthetic BMD assessment to reduce variability and improve reliability. Key recommendations include:

- Establishing consensus guidelines for ROI placement and patient positioning.
- Ensuring transparency and uniformity in reporting DXA protocols in clinical trials and studies.
- Encouraging manufacturers to harmonize software algorithms for pBMD analysis.

Addressing these challenges will enhance the clinical utility of pBMD measurements and facilitate the development of evidence-based strategies for managing bone health in arthroplasty patients.

P680

NANO-COMPOSITION OF CISSUS QUADRANGULARIS: ENHANCED EFFICACY AND PROMISING PHARMACOKINETIC PROFILE IN THE MANAGEMENT OF OSTEOPOROSIS

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Osteoporosis is a chronic condition characterised by decreased bone mass density and weakening bones, making them fragile and more prone to fractures. Fractures can lead to reduced quality of life, disability and increased mortality. Risk factors for osteoporosis include ageing, hormonal changes, unhealthy eating habits and lifestyle, certain medication's side effects etc. Post-menopausal women are at high risk of Osteoporosis. As per the World Health Organization worldwide, osteoporosis affects approximately 2/3rd of postmenopausal women. By 2050, the worldwide incidence of hip fracture will be increased by 240% in women and 310% in men, compared to rates in 1990.

Due to the chronic nature of the disease, high cost & severe side effects associated with conventional treatment, there is a need for effective herbal formulation.

However, the main obstacle to treating chronic diseases with herbal preparations is their poor bioavailability, palatability and hence poor efficacy.

In this contrast, the osteoprotective herb; *Cissus quadrangularis* was properly characterised, screened, standardised and prepared its bioactive form. While blending with natural and biodegradable excipients and processing with improved methodology, nano-formula for oral delivery was developed. The bioavailability and efficacy of the developed nano-formula were enhanced significantly as proved by pre-clinical osteoporotic rat model studies.

P681

ASSOCIATION BETWEEN VITAMIN D DEFICIENCY AND OSTEOPOROSIS IN SYSTEMIC SCLEROSIS: A META-ANALYSIS

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Introduction Systemic sclerosis (SSc) is a chronic autoimmune disease associated with high morbidity and mortality. Its pathogenesis remains poorly understood, but vitamin D deficiency has been implicated as a contributing factor. Given the established link between vitamin D deficiency and osteoporosis, SSc patients may also be at increased risk of compromised bone health. This meta-analysis aimed to quantify serum vitamin D levels in SSc patients compared to healthy controls, evaluate differences between diffuse and limited SSc subtypes, and explore associations with clinical phenotypes, including those with potential implications for osteoporosis, such as gastrointestinal (GI) and lung involvement, digital ulcers, and anti-Scl-70 antibody positivity.

Methods This meta-analysis evaluated serum vitamin D levels in 12 studies comprising 836 SSc patients and 537 healthy controls. Subgroup analyses examined differences by SSc subtype and clinical phenotypes. Serum 25(OH)D levels were used as the marker for vitamin D status. Heterogeneity was assessed using the I^2 statistic, and publication bias was evaluated with funnel plots.

Results SSc patients exhibited significantly lower vitamin D levels than healthy controls (mean difference [MD]: -9.44, 95% confidence interval [CI]: -12.07 to -6.80, P < 0.00001). Subgroup analyses revealed no significant differences in vitamin D levels between diffuse and limited SSc subtypes or among patients with complications such as gastrointestinal (GI) involvement, lung involvement, digital ulcers, or anti-Scl-70 antibody positivity. The high prevalence of vitamin D deficiency in SSc patients suggests a potential exacerbation of osteoporosis risk, particularly given the systemic nature of the disease and its impact on bone metabolism.

Conclusion Vitamin D deficiency is frequently observed in SSc patients and may not only play a role in disease pathogenesis but also contribute to secondary complications, such as osteoporosis. These findings underscore the importance of addressing vitamin D deficiency in clinical practice, particularly to mitigate the potential burden of osteoporosis, and highlight the need for further research to clarify its therapeutic potential.

Figure 1. Meta-analysis of the vitamin D difference between patients with systemic sclerosis and healthy control

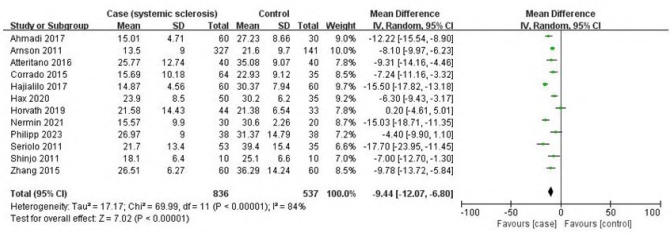
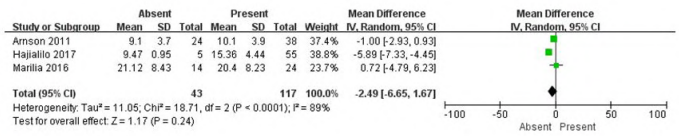
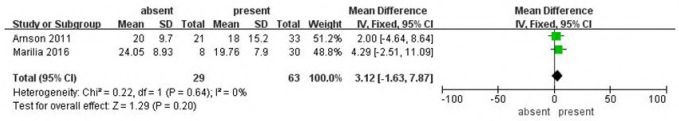


Figure 2. Subgroup analyses for vitamin D levels based on complications, including gastrointestinal involvement (A), lung involvement (B), digital ulcers (C), and Anti-Scl-70 antibody positivity (D)

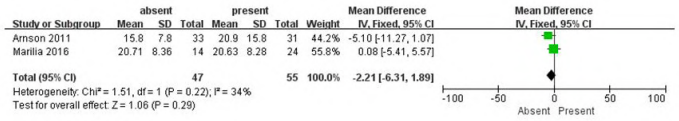
(A)



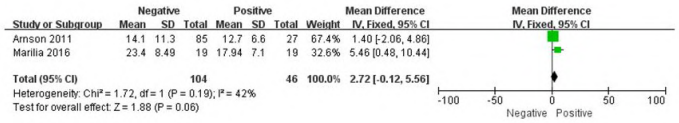
(B)



(C)



(D)



P682

META-ANALYSIS: COMPARISON OF ANKLE ARTHROPLASTY AND ARTHRODESIS IN RHEUMATOID ARTHRITIS PATIENTS

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Objectives

The objective of this meta-analysis is to compare the clinical outcomes of ankle arthroplasty and arthrodesis in rheumatoid arthritis patients, focusing on pain relief, functional improvement, complication rates, and reoperation rates.

Methods

A systematic review was conducted based on PRISMA guidelines, including six studies with a total of 216 patients (112 treated with arthroplasty and 104 with arthrodesis). Relevant studies were identified through a comprehensive search of PubMed, Embase, and Cochrane Library databases. Data on pain scores, functional outcomes, complication rates, and reoperation rates were extracted and analyzed using a random-effects model. Heterogeneity among studies was evaluated using the I^2 statistic, and statistical significance was set at $p < 0.05$.

Results

Both ankle arthroplasty and arthrodesis significantly reduced postoperative pain in rheumatoid arthritis patients. Ankle arthroplasty demonstrated greater pain relief, with a mean improvement

of 1.5 points on the visual analog scale (VAS) compared to arthrodesis. Functional improvement, as measured by standardized scoring systems such as AOFAS scores, was also higher in the arthroplasty group, with an average improvement of 10 points. However, arthroplasty was associated with higher complication rates, including implant loosening and infection, compared to arthrodesis. Reoperation rates were also higher in the arthroplasty group (25%) compared to the arthrodesis group (12%).

Conclusions

In rheumatoid arthritis patients, ankle arthroplasty provides superior pain relief and functional improvement compared to arthrodesis. However, it carries a higher risk of complications and reoperations. These findings highlight the importance of individualized treatment planning and shared decision-making when selecting surgical interventions for ankle involvement in rheumatoid arthritis. Further randomized controlled trials are needed to confirm these findings.

P683

PERSISTENT FLU-LIKE SYMPTOMS IN A PATIENT WITH OSTEOPOROSIS ON ALENDRONIC ACID THERAPY

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Introduction: According to the recommendation of the International Foundation of Osteoporosis, bisfosfonates are the first line treatment for osteoporosis in postmenopausal women. Vertebral fractures, hip fractures, and other non-vertebral fractures can be prevented by taking alendronate.

Case report: After undergoing bone densitometry, a 52-year-old postmenopausal woman was found to have lumbar and hip osteoporosis. She received treatment only for arterial hypertension throughout her life, and all basic control laboratory tests were within the norm, as well as calcium, ALP, TSH, and PTH levels. The level of vitamin D3 was insufficient. The use of alendronic acid was started once a week.The patient experienced flu-like symptoms like a temperature reaching 37.5 degrees Celsius, myalgia, arthralgia, and chills that lasted for 24 hours after the first dose. It was thought to wait since the literature reports cases of flu-like symptoms in patients receiving alendronate therapy, but these symptoms are transient and can be minimized by taking other doses until they disappear. The patient stated that she had been experiencing flu-like symptoms for two months, 24 hours after taking the medication, and they were getting worse and not improving. It was decided to change the therapy to risedronate and the patient no longer experienced any side effects.

Conclusions: Flu-like symptoms are reported in patients receiving alendronate therapy, but they are temporary and can be minimized by taking other doses until they disappear. If flu-like symptoms become more severe, it is recommended to alter the treatment so the patient no longer experiences any negative side effects.

Keywords: flu-like symptoms, postmenopause osteoporosis, alendronate

P684

THE PREVALENCE OF OSTEOPOROSIS AMONG PATIENTS WITH FIBROMYALGIA

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Introduction and Objective(s): Fibromyalgia is associated with the risk of osteoporosis. The reason may be linked to the lack of adequate physical activity due to chronic pain and low levels of vitamin D3 due to less sunlight exposure. The purpose of this study is to assess whether osteoporosis is common among patients with fibromyalgia.

Material and methods: This study included 47 patients (45 F: 2 M) in the age range of 40-55 years, who were diagnosed with fibromyalgia. The patients didn't take glucocorticoids, had no history of thyroid diseases, had no history of other rheumatological diseases, or any chronic diseases, and neither smoked nor consumed alcohol. The female patients were not experiencing postmenopause. All the patients had normal body mass index (BMI). Bone densitometry was recommended for each patient.

Results: 29.78% of the patients had osteoporosis, but not severe osteoporosis. All of the patients were female. No male patients were diagnosed with osteoporosis. 14,89 % had lumbar osteoporosis, 8,51% had only hip osteoporosis and 6,38% had lumbar and hip osteoporosis. Patients suffering from osteoporosis reported that they have a sedentary lifestyle and spend less time exposed to sunlight. Patients without osteoporosis reported that they walk for about an hour every day and take vitamin D3 supplements.

Conclusions: Fibromyalgia is considered a risk factor for osteoporosis only for patients who do not engage in physical activity and do not take vitamin D3 supplements.

Keywords: osteoporosis, fibromyalgia, vitamin D3, physical activity

P685

IMPORTANCE OF OSTEOPOROSIS CONTROL IN PATIENTS ATTENDING RESPIRATORY REHABILITATION CONSULTATION

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Objective

In the respiratory rehabilitation practice it is common to see patients with chronic pulmonary diseases and patients requiring prehabilitation prior to surgery, who are at high risk of osteoporosis due to factors such as immobility, sarcopenia, prolonged immunosuppressive treatment and systemic inflammatory status. In this context, management of osteoporosis in patients attending a respiratory rehabilitation clinic may lead to improved physical function, especially by reducing the risk of fragility fractures. To this end, we analyse our clinical experience in the manage-

ment of osteoporosis in the respiratory rehabilitation clinic of our hospital.

2. Material and Methods

Observational, descriptive and retrospective study, based on the review of clinical records of patients seen in the respiratory rehabilitation clinic. The study population consisted of patients seen in the respiratory rehabilitation clinic during the last year, who completed at least six months of follow-up in the service, and in whom bone metabolism studies were carried out, a total of 43 patients. The mean age was 67 years. Through clinical, analytical and densitometric parameters, the prevalence of normal bone metabolism (8), osteopenia (13), osteoporosis (17) and severe osteoporosis (4) was established, as well as the risk of fracture as low (20), moderate (1), high (15) or very high (6). The incidence of new fragility fractures (6) was also analysed. Functional tests and quality questionnaires were also carried out to establish the physical functionality of the patients.

3. Results

In the patients studied in whom osteoporosis control was established, an increase in bone mineral density, a low incidence of fractures, stabilisation of analytical parameters and improvement in physical function were observed.

4. Conclusions

The study of osteoporosis in the respiratory rehabilitation consultation is a crucial opportunity to promote improvements in the physical functionality of patients, reducing the risk of fractures, preventing sarcopenia and improving their quality of life.

P686

EFFECTIVENESS OF PRESCRIPTION GLUCOSAMINE SULFATE (PGS) IN A COHORT OF FILIPINO PATIENTS WITH MILD-MODERATE KNEE OSTEOARTHRITIS (OA)

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Objective

To evaluate the effectiveness of pGS in reducing the severity of pain in patients with mild to moderate knee OA pain.

Materials and Methods

A multicenter, low interventional parallel-group 8-week study in Manila, Philippines recruited participants aged 50-70 years with mild to moderate knee OA(diagnosed using American College of Rheumatology criteria). All patients had baseline Western Ontario and McMaster Universities Osteoarthritis Index(WOMAC) score≥40, a BMI<29.99 and received pGS for 4 weeks. Thereafter patients either remained on monotherapy for a further 4 weeks or had their pain relief supplemented with celecoxib 200 mg OD depending on patient preference and their response to treatment with pGS at 4 weeks. This abstract focuses on the pGS monotherapy arm only. The primary end point was reduction from baseline in knee pain severity at week 8 based on the WOMAC Pain and visual analogue scale(VAS)(0 to 100mm) scores.

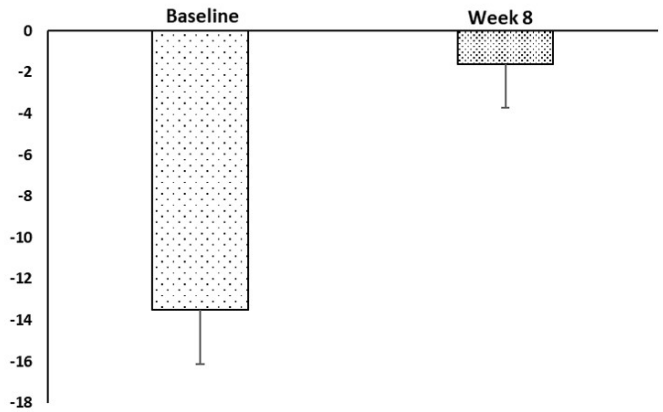
Results

Of 324 screened subjects, 281 treated; 244 completed 8 weeks of pGS treatment. At week 8, WOMAC pain scores showed a significant reduction (least square mean (LSM) change of -11.96,P< 0.0001)(Table 1)(Figure 1A). Similarly, VAS scores showed a significant reduction compared to baseline(LSM change of -56.36,P< 0.0001)(Table 1)(Figure 1B).

	Baseline	Week 8
	pGS(n=279)	pGS(n=244)
WOMAN pain score(SD)	13.5(2.63)	1.6(2.10)
WOMAN pain score LSM change		-11.96(95%CI;-12.26 to-11.67)
VAS score(SD)	68.4(10.89)	11.9(12.33)
VAS score LSM change		-56.36(95%CI; -58.05,-54.67)

Table.1: WOMAC pain outcomes mean value(SD) and VAS(SD) score in Full Analysis Set(FAS) population(n=279) with knee OA receiving pGS(1500 mg QD) for 8 weeks

A)



B)

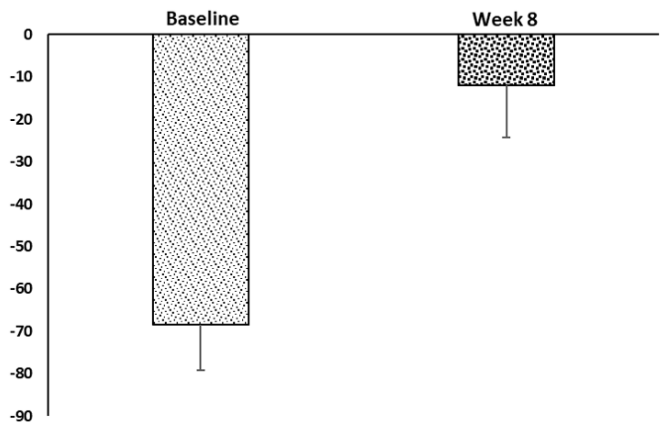


Fig.1: knee OA patients(FAS population,n=279) treated with pGS; A)WOMAC pain index at baseline and week 8(P<0.0001) in knee OA patients treated with pGS; B)VAS score at baseline and week 8(P<0.0001) .

Conclusion
Prescription Glucosamine Sulfate (pGS) demonstrated a significant reduction in knee OA pain in patients with mild to moderate osteoarthritis at the end of 8 weeks.

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A SINGLE INJECTION OF SAPHENOUS NERVE BLOCK IN OSTEOARTHRITIS PATIENTS AFFECTED THE REDUCTION OF POSTOPERATIVE BLEEDING

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Objectives
In elderly patients, the vital sign tends to fluctuate according to the volume status, which may cause sudden hypovolemic shock if postoperative bleeding continues. Elderly patients, especially those who undergo surgery for arthritis, need more attention because the bleeding may persist over the joints after surgery. The appropriate pain control is related to postoperative blood loss.
Recently, a continuous nerve block through the catheter has been widely used for analgesia and reducing the side effects of the drug. However, there is a disadvantage that it is difficult to manage the catheter. This study was conducted to assess postoperative pain control and reduction of blood loss with a single injection of saphenous nerve block in elderly osteoarthritis patients.
Material and Methods
We reviewed the electronic medical records of patients who had undergone uni-knee total arthroplasty with spinal anesthesia between January and May 2016. A total of 51 patients were enrolled in this study. All patients were treated with intravenous patient-controlled analgesia for postoperative pain control, and additional analgesic agents were administered at VAS above 6 scores. In 25 patients, the saphenous nerve block was performed using ultrasound with 0.75% ropivacaine 15ml before surgery.
Results
Patients administered additional analgesics during the maintenance period of intravenous patient-controlled analgesia were significantly lower in the nerve block group (p=0.007). In addition, the volume of blood loss from catheter drainage was significantly less at 2 and 3 days postoperatively (p=0.013, p=0.041, respectively) in the nerve block group.
Conclusion
In patients who underwent total arthroplasty with osteoarthritis, even if only a single injection of nerve block, is helpful for postoperative pain control and the reduction of bleeding.

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SURVEY OF KNOWLEDGE, ATTITUDES AND PRACTICES OF PRIMARY CARE PHYSICIANS ON EXERCISE PRESCRIPTION IN PATIENTS WITH OSTEOPOROSIS

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Physical activity has benefits on bone health and reduces the risk of falls(1). Osteoporosis guidelines include physical activity as relevant intervention. Are Primary Care Physicians (PCP) aware of the risks of physical inactivity? Are they knowledgeable and trained to prescribe exercise modalities in general or for specific conditions like osteoporosis?
Objective: To design and validate a questionnaire on knowledge, attitudes and practices on exercise prescription for PCP caring for patients at risk of osteoporosis.
Methods: An instrument was designed with 21 items (7 on knowledge, 11 on practice and 3 on attitude) and reviewed by a group of experts, on face validation and content and 4 of them proposed minor modifications for clarity. The target population is active PCP who agree to voluntarily participate in an anonymous survey. The final instrument, including 21 closed-ended questions, was applied face-to-face to 30 PCP (15 women and 15 men, with mean age of 30.5 years) by 2 trained observers, including information on demographics and years of practice. Cronbach's alpha test(2) was applied to the responses resulting in a reliability coefficient of 0.6830. The instrument was then applied to a larger group of PCP, both face to face and by E-Mail. Findings are reported with simple statistics.
Results: Final instrument was applied to 121 PCP (63.6% female) with a mean age of 42.7 years and time since graduation from School of Medicine of 17.5 years. Of these, 50 (41.3%) work in private practice and the rest in a public health institution. All agreed on participating, and 57% had an interview and the rest, online. There was high agreement among PCP in considering that exercise should be part of the routine management of osteoporosis, less solid confidence about its actual efficacy. Most prescribe combined forms of exercise but 65.2% are unsatisfied with their abilities in this field and all agree in the desire to know more about the prescription of exercise to patients at risk of osteoporosis.
Conclusions: This survey on prescription of exercise to people with osteoporosis shows reasonable reliability and reveals areas for potential improvement, where Clinicians see themselves with limited abilities.
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SCREENING FOR ORAL HEALTH PROBLEMS IN PATIENTS WITH OSTEOPOROSIS: A PILOT STUDY WITH THE ORAL HEALTH ASSESSMENT TOOL (OHAT).

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Clinicians may have limited ability to identify oral health problems[1]. Drug-associated osteonecrosis of the jaw (DAONJ) is a rare complication in patients undergoing invasive dental procedures (IDPs) who receive anti-resorptive or anti-angiogenic drugs. Detection of problems that may require IDPs may aid in planning safer anti-resorptive therapy[2].
Objective: To determine the usefulness of OHAT in patients receiving treatment for osteoporosis, to identify oral problems that require referral for dental care.
Methods: Exploratory, observational study in the population of Dentistry, Rheumatology and Geriatrics of Hospital Aranda de la Parra, applying face to face in daily practice, a validated Spanish version of OHAT[3] as a table with space for answers. It was applied by 2 dentists in daily patients (≥ 50 years of age), evaluating whether the scale coincides with findings in dental evaluation. Then, it was applied by a rheumatologist and a geriatrician in patients with osteoporosis, with gloves, tongue depressor and source of light. Demographic information and Charlson Co-morbidity Index were included. For this study, candidates for dental referral are defined by one or more items rated 2 or an overall grade ≥4. We used simple descriptive statistics.
Results: 40 patients (mean age 68.3 ±8.8 years) seen by 2 dentists were included. Mean OHAT score was 7.5 (±3.8). All OHAT findings coincided with complete dental review. Besides 80 osteoporosis patients (mean age 75.1 ±8.8 years), had a mean OHAT score of 3.2 (±2.1). Charlston Co-morbidity Index was 4.28 (±1.65). Twelve of them (15%) had one or more items answered as 2 and 32 (40%) had an overall score of ≥4, defining them as candidates for dental evaluation. Most patients (58.7%) had not seen a dentist in 12 or more months. In both groups of patients, the highest ratings referred to tooth alterations (cavities, breakage, wear) and cleanliness (tartar and food debris).
Conclusions: OHAT is effective identifying common oral health problems and may aid to identify patients with osteoporosis requiring dental evaluation to plan potential IDPs before certain drugs, to limit the risk of DAONJ.
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25OHD IN SUPPLEMENTED AND NOT SUPPLEMENTED WOMEN. RELATION WITH AGE, SEASONS, BMI AND WEIGHT

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Objective: relate 25OHD with age, seasons, BMI and weight.
M and M: Retrospective study of 1086 women from Argentina (2020-2024): 421 (SW) received 25OHD supplementation (≥3 months before measurement) and 665 (NSW) did not.
Variables measured: age, weight, height, 25OHD, season of the year, and osteoporosis treatment (OT yes=Ot, no=No.Ot).
Data are presented as mean ± SD. Spearman's cor. Coef., ANOVA with post hoc test, and Chi-square test were used, significance level 0.05.
Results:
SW: age: 63.4 ± 10.3 years; weight: 62.8 ± 12.3 kg; BMI: 25.3 ± 4.9; 25OHD: 42.6 ± 11.6 ng/mL; 35.2% received OT.
NSW: age: 53.1 ± 14.7 years; weight: 67.9 ± 15.8 kg; BMI: 26.5 ± 5.9; 25OHD: 21.8 ± 8.2 ng/mL; 4.5% received OT.
OT proportion differs (p<0.001) between SW and NSW groups.
-25OHD, supplementation and OT:
SW & Ot: 44,5 ± 12.2; SW & No.Ot: 41.6 ± 11.0;
NSW & Ot: 27,4 ± 9.3; NSW & No.Ot: 21.5 ± 8.1.
-Age (y) SW: < 50: 38.9 ± 8.5; 50-65: 42.6 ± 11.3; > 65: 43.3 ± 12.4;
NSW: < 50: 21.3 ± 8.4; 50-65: 22.4 ± 7.9; > 65: 21.4 ± 8.5
-BMI. SW: < 25: 43.5 ± 11.7; 25-30: 41.4 ± 11.7; > 30: 41.0 ± 10.6;
NSW: < 25: 22.8 ± 8.3; 25-30: 22.2 ± 8.2; > 30: 18.6 ± 7.5.
-Season
SW: Summer: 43.9 ± 13.1; Fall: 43.2 ± 13.0; Winter: 41.3 ± 10.8; Spring: 42.8 ± 10.1 (ns) NSW: Summer: 26.4 ± 9.0; Fall: 23.9 ± 8.3; Winter: 18.5 ± 6.4; Spring: 21.4 ± 8.0. Winter and spring differ from the rest, fall and summer don't differ from each other.
-Association of 25OHD
SW: Weight coef=-0.14 p=0.0043; BMI coef= -0.11 p=0.0268
NSW: Weight coef=-0.17 p<0.0001; BMI coef= -0.18 p<0.0001
The moving average grouped by three-year periods showed an increase in supplemented women over time.
Conclusions: 25OHD is lower in obesity and in winter and spring in NSW.

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ABOUT A CASE: PARATHYROID ADENOMA AND PATHOLOGICAL HUMERAL FRACTURE IN A 54-YEAR-OLD MAN

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Objective

The objective of this paper is to present the case of a 54-year-old man who came to the Primary Care clinic with intense pain in the right arm, with functional impotence, and also reporting bone pain, generalized muscle weakness and lack of concentration, poor appetite and occasional nausea for weeks. There were no associated traumas that the patient remembers, but the functional impotence is believed to be related to a movement he made with his arm when getting up.

Material and Methods

We decided to order a humerus x-ray and requested a blood test, as well as a bone densitometry. The x-ray showed a fracture of the proximal humerus and the analysis showed severe hypercalcemia (greater than 14 mg/dl) with elevated parathyroid hormone, so we referred the patient to the emergency room, and the patient was admitted to hospital after administering treatment for the fracture and for the hypercalcemia with zoledronic acid, diuretics and intravenous fluid therapy.

Results

During hospital admission, it was concluded that the hypercalcemia and consequent osteoporosis that caused a pathological fracture were due to a carcinoma of the lower left parathyroid gland, and surgical treatment was indicated.

Conclusions

According to the Recommendations of the Spanish Society of Rheumatology for Osteoporosis, a fragility fracture in the proximal humerus (like our patient) in men over 50 years of age and with a T score <-1 is diagnostic of osteoporosis. In the case of our patient, bone densitometry indicated a T score of -3.5 in the hip and -3-6 in the spine, which are also diagnostic of osteoporosis.

The case of our patient exposes the association between hyperparathyroidism and osteoporosis: the onset was initiated by a pathological fracture. Excess parathyroid hormone alters the normal balance of calcium, leading to an increase in plasma calcium (hypercalcemia) and the symptoms of hypercalcemia, causing osteoporosis.

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UPPER BACK PAIN REVEALING THORACIC SPONDYLODISCITIS: A CASE REPORT

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Objectives: Spondylodiscitis is an infection of the body and vertebral disc whose early detection and treatment can prevent future relevant pathologies, such as compressive myelopathy. It is important to perform a detailed physical examination and complementary tests that avoid a late diagnosis that increases the comorbidity of the condition. We present a case of 66-year-old male who presented with back pain and diagnosed to have spondylodiscitis.

Material and Methods: A 66-year-old male with no medical comorbidities, with 4 months history of upper back pain and intermittent fever of up to 39ºC coinciding with the same. Associated morning stiffness was present. He has received analgesic treatment without improvement. Dorso-lumbar X-ray: vertebral degenerative changes. Laboratory analysis revealed high acute inflammatory parameters and nuclear magnetic resonance of thoracic spine revealed signs of osteomyelitis in the disc-vertebral body complex D8-D9 with a large anterior paravertebral and epidural abscess causing severe dorsal stenosis with spinal cord compression and signs of compressive myelopathy. Blood cultures: Staphylococcus aureus positive.

Results: Based on collected results, we have concluded that diagnosis was infectious spondylodiscitis with left paravertebral abscess and antibiotic therapy was performed. The patient is currently without back pain or fever.

Conclusions: Early diagnosis of bacterial spondylodiscitis remains a challenge due to the nonspecific signs and symptoms reported by the patient and the wide variability of laboratory results and imaging. The basis for early diagnosis remains the clinical suspicion at the time of initial treatment.

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EXERCISE-INDUCED RHABDOMYOLYSIS: A CASE REPORT

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Objectives: Rhabdomyolysis is a syndrome caused by disruption of skeleton muscle with the release of muscle tissue content into the circulation that can lead to the life-threatening systemic complications of acute kidney injury, compartment syndrome, and disseminated intravascular coagulopathy. Here we present a case of exercise-induced rhabdomyolysis caused by a lower extremity training.
Material and Methods: A 21-year-old man with a 2-day history of lower extremity pain and soreness and 1 day of gross hematuria. He reported that the pain began the second day after he went to the gym doing lower extremity exercise training. The day prior to his presentation, the patient developed gross hematuria, without back pain and fever. He reported no history of previous medical conditions or medications. Physical examination showed muscle tenderness but no edema. Urinalysis showed protein 2+ and urine occult blood +. Laboratory work-up demonstrated a creatinine kinase (CK) of 160,500 IU/L, alanine aminotransferase (ALT) of 320 IU/L, aspartate aminotransferase (AST) of 1419 IU/L. His blood urea nitrogen (BUN) and serum creatinine were 7.28 mmol/L and 95 µmol/L, respectively.
Results: Based on his markedly elevated CK, myalgia, and myoglobinuria, he was diagnosed with exercise-induced rhabdomyolysis. After treatment with vigorous hydration and sodium bicarbonate, his pain and laboratory tests improved.
Conclusion: Measures such as warming-up and periodic repetition of eccentric exercises, along with sufficient water intake, should be considered for people who exercise for the first time or those with poor body fitness to aim to prevent exertional rhabdomyolysis.
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UNUSUAL INFLAMMATORY ARTHRITIS: A CASE REPORT

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Objectives: Adult Onset Still's disease (AOSD) is an inflammatory disorder characterized by quotidian (daily) fevers, arthritis, and an evanescent rash. It is a rare inflammatory disorder of unknown etiology. Due to lack of definitive diagnostic test, the diagnosis of AOSD can only be made after exclusion of other causes. We present a case of adult onset Still's disease.
Matherial and Methods: An 84-year-old woman with two weeks histoy of fever, polyarthritis with edema in both hands, sore throat and erythematous macular rash on the arms, neckline and back that did not improve despite conservative treatment. Exploration and complementary tests: Good general condition with good vital signs. Highlight the lung auscultation crackles in the right base, with rest unremarkable exploration. Hemogram with predominantly polymorphonuclear leukocytosis, elevated acute phase reactants, ferritin, and transaminases. Referred for hospital admission. Negative blood cultures, urine antigen detections, and autoimmunity. Chest, hands, wrists, lumbar spine, pelvis, and sacroiliac X- rays with marked signs of generalized degenerative osteoarthritis without lytic or blastic lesions. Chest CT showing bilateral pleural effusion and minimal pericardial effusion.
Results: When infectious and tumor processes were ruled out, treatment with high-dose steroids was started, associating weekly methotrexate. Clinical judgment: Adult Onset Still's disease. She is doing well and is completely symptom free.
Conclusions: Adult Still's disease is a systemic inflammatory pathology with a prevalence of 1/100,000 people, whose diagnosis and etiology remain unclear, and may be related to viral infections, a certain seasonality in the symptoms, as well as activity factors and prognosis, the concentration of interleukin 1 and the increase in serum ferritin. Since the delay in its diagnosis leads to a worsening in the prognosis of patients (40% will have a chronic course), it is essential a high clinical suspicion based on the Yamaguchi criteria (fever with evening peaks, rash, inflammatory arthralgia, intense sore throat, and leukocytosis with a predominance of polymorphonuclear cells and hyperferritinemia) for optimal and early treatment.
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OSTEOSARCOPENIA IN SPAIN. BONECARE STUDY

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Introduction
Osteosarcopenia is a geriatric syndrome resulting from the combination of sarcopenia and low bone mineral density. It's a phenotype that is associated with a higher risk of falls, fractures,

dependence and health care costs than its separate components. The aim of this study was to assess the prevalence of sarcopenia in community-dwelling patients with osteoporosis (osteosarcopenia) in Spain and to determine associated risk factors.

Material and Method

Descriptive and analytical cross-sectional observational study done during the year 2023 in Primary Care Health Centres in Spain. Patients over 49 years of age with a diagnosis of OP (densitometry -2.5 SD) were included by simple probability analysis. Patients with other pathologies that alter bone mass were excluded, a sample of 490 patients was calculated and the presence of sarcopenia was assessed using the SARC-F questionnaire and lower leg circumference. To evaluate predictors, clinical and lifestyle variables were analysed using multiple regression analysis. Protocol and informed consent approved by the Ethics Committee (Ref.2526).

Results

A total of 1,123 patients were included with a mean age of 71.7 (±9.9) years, 91.5% female. The overall prevalence of osteosarcopenia in the sample was 42.7%. The most relevant associated risk factors were age (22.5%, 50-64 years, and 48.7%, ≥75 years; $p < 0.05$), female sex (46.4% vs. 32.0%, $p < 0.05$), diagnosis of cognitive deterioration (OR: 1.35-2.49, $p < 0.05$), poor nutritional status (OR: 1.99-3.17, $p < 0.01$), falls in the last year (OR: 2.23-4.25, $p < 0.05$), osteoporotic fractures (OR: 4.55-6.21, $p < 0.01$) and physical inactivity (OR: 5.67-8.35, $p < 0.001$).

Conclusions

The prevalence of osteosarcopenia is high, highlighting the importance of a comprehensive assessment of musculoskeletal health in patients with osteoporosis, and the need for interventions aimed at improving physical activity, nutritional status and fall prevention to reduce the prevalence of osteosarcopenia.

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THE RELATIONSHIP BETWEEN BONE AND MUSCLE HEALTH IN A MONGOLIAN POPULATION: A FIRST LARGE-SCALE OBSERVATIONAL STUDY

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Objectives: To explore the correlation between muscle and bone health and to estimate the FRAX risk for major osteoporotic fractures and hip fractures in the Mongolian population, stratified by age and sex.

Methods: A cross-sectional study was conducted across various health units in Ulaanbaatar and regional Mongolia from May to August 2024. Participants (n=857) were assessed for handgrip strength, sarcopenia risk using the SARC-F test, and bone mineral density (t-score) via ultrasound. The FRAX model was used to calculate fracture risks.

Results: A total of 857 individuals (median age: 52 years, range: 44-66) were recruited, with 30.1% women. The median grip strength was 28 kg (range: 21-35). Most participants (69.5%) had a low risk of sarcopenia according to the SARC-F. The median T-score for bone mineral density (BMD) was -1.9. A very weak but significant correlation was found between FRAX MOF score and SARC-F ($p < 0.001$), FRAX hip score and SARC-F ($p = 0.004$), as well as between BMD T-score and handgrip strength ($p = 0.02$). Age- and sex-specific values for FRAX major osteoporotic and hip fracture risks were proposed. The risk of major osteoporotic and hip fractures increased with age in both sexes, with higher rates observed in women compared to men. Individuals with moderate to high sarcopenia risk (SARC-F ≥ 4) have significantly higher risks for major osteoporotic fractures and hip fractures, along with lower BMD T-scores, suggesting poorer bone health. In women, lower grip strength (<18 kg) is associated with higher risks of osteoporotic fractures, hip fractures, and lower bone mineral density. Men with lower grip strength (<28 kg) also face increased risk for hip fractures and lower BMD.

Conclusions: This study provides insights into the association between muscle and bone health in the Mongolian population. FRAX values for osteoporotic and hip fractures contribute to a better understanding of fracture risk across different age and sex categories

Keywords: muscle strength, sarcopenia, bone mineral density, FRAX, osteoporotic fractures, Mongolian population

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FOOTBALL AS A STRATEGY FOR IMPROVING BONE HEALTH IN WOMEN: A REVIEW AND META-ANALYSIS

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Objetive The research examined clinical trials using football as an intervention for female populations through both systematic

review processes and meta-analytic syntheses. The research investigated bone mineral density (BMD) and bone mineral content (BMC) parameters to measure quantitatively the effects of football training activities on bone health. This research combined multiple research studies to collect evidence about how football training can improve skeletal health through its osteogenic properties in female athletes.

Materials and Methods A random-effects meta-analysis was conducted based on clinical trials retrieved from comprehensive searches in the following databases: Medline (PubMed), Medline (OVID), Embase, Scopus, Web of Science, and Cochrane Library. Clinical Trialas that examined football as an intervention's effects on bone health among female subjects were included. Each study's bias risk received evaluation through assessment using the Cochrane Risk of Bias (ROB) tool.

Results A total of four studies met the inclusion criteria for this review. One of these studies included two follow-up time points, which were analyzed separately as independent data points, yielding a total of five datasets. The meta-analysis revealed that none of the analyzed parameters demonstrated statistically significant improvements in women who participated in football interventions. The meta-analysis results showed no significant changes to any analyzed parameters from football training for women participants.

Specifically, the analysis of total BMD resulted in a standardized mean difference (SMD) of 0.0105 with a 95% confidence interval (CI) ranging from -0.0062 to 0.0272 (p>0.05). Similarly, for lower limb BMD, the SMD was 0.0789 (95% CI: -0.0212 to 0.1790). The evaluation of BMC followed the same trend, with total BMC yielding an SMD of 0.4262 (95% CI: -0.4498 to 1.3022), and lower limb BMC showing an SMD of 0.7918 (95% CI: -0.2369 to 1.8205), neither of which reached statistical significance.

Conclusion This meta-analysis demonstrates that soccer interventions in women do not lead to achieve significant benefits for either bone mineral density or bone mineral content measurements. This conclusion requires cautious interpretation because the possibility of a Type II error remains a concern given the small sample sizes in reviewed studies and low number of qualified studies selected for analysis. Further research with larger, high-quality trials is warranted to conclusively determine the impact of football on bone health in female populations.

P699

CONSISTENT BONE DENSITY ACROSS GENOTYPES: A THREE-YEAR LONGITUDINAL STUDY OF THE GREB-1 RS5020877 POLYMORPHISM IN HEALTHY AND BREAST CANCER SURVIVING WOMEN USING PQCT AND HEEL ULTRASOUND

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Objective: The GREB1 gene (Growth Regulation by Estrogen in Breast Cancer 1) has been frequently studied for its role in the progression of estrogen-stimulated tumors, such as breast cancer. However, its function outside of this oncological context remains poorly understood. Our aim was to determine whether the presence of the rs5020877 polymorphisms of the GREB1 gene associate with differences in volumetric BMD and quantitative heel ultrasound in breast cancer survivors and healthy controls and also to analyze the differences in the distribution of the studied genotype of the GREB1 gene in the study sample.

Materials and Methods: This study conducted a three-year longitudinal study on postmenopausal women, assessing bone mass at baseline, and then yearly up to three years. The cohort included breast cancer survivors and healthy controls. Techniques used included peripheral quantitative computed tomography (pQCT) with a Stratec XCT 2000 and quantitative heel ultrasound (QUS) via a GE Sahara sonometer. Additionally, SNP genotyping for GREB1 rs5020877 employing Taqman® probes to examine genetic influences on bone density was used.

Results: The analyzed sample comprised 344 controls and 104 breast cancer survivors. At baseline, the median age was 59 (IQR=7) and 62 (IQR 13.25) for controls and survivors, respectively (p=0.007). No significant differences were observed between the two groups regarding weight, BMI, and age at menarche. However, years since menopause differed significantly (9 years for controls and 11 years for survivors (p=0.003)). There were no significant differences in genotype frequencies between the groups (p=0.056), and notably, no GG genotype was found among the breast cancer survivors. Longitudinal comparisons of mean differences in bone density measures from baseline to the second year, from the second to the third year, and from baseline to the third year revealed no statistically significant variations between the groups or among rs5020877 genotypes (p>0.05 in all cases). These comparisons were adjusted for age and years since menopause, utilizing both pQCT and QUS.

Conclusions: In this study, no significant differences were observed in the distribution of the rs5020877 genotype of the GREB1 gene between healthy women and breast cancer survivors. Following a three-year follow-up, it appears that the rs5020877 genotype does not influence the progression of bone mass, as assessed by pQCT and QUS, in the studied postmenopausal women.

P700

DRIVING KNEE OSTEOARTHRITIS STRUCTURAL PROGRESSOR PROGNOSIS INTO THE NEXT GENERATION: LEVERAGING MACHINE/DEEP LEARNING, MICRORNA AND MAGNETIC RESONANCE IMAGING

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Objective: Predicting knee osteoarthritis (OA) patients at risk of rapid structural progression remains challenging. Circulating micro-RNAs (miRNAs) showed promise as biomarkers for stratifying such patients. This study aimed to develop a miRNA-based prognosis model to identify knee OA structural progressors using machine/deep learning, with structural progressors defined via a methodology using MRI and X-ray data[1].

Methods: Baseline serum miRNAs from 152 Osteoarthritis Initiative (OAI) participants were isolated, sequenced, and used for model development. Dimensionality reduction was performed to identify the most informative miRNAs within the initial set of 456. Key miRNAs and OA determinants, including age, sex, BMI, and race (Caucasian and African American), were selected after a comprehensive exploration of 7 feature selection machine learning. The final model was developed after extensively exploring an array of machine/deep learning algorithms. The performance of the models was assessed using AUC, accuracy, sensibility, and specificity. Validation employed an independent cohort of 30 OAI baseline plasma samples.

Results: Feature clustering reduced the initial set to 107 miRNAs. Elastic Net was identified as the optimal feature selection model. The final prediction model utilized an Artificial Neural Network (ANN) comprised of age and four miRNAs, hsa-miR-556-3p, hsa-miR-3157-5p, hsa-miR-200a-5p, and hsa-miR-141-3p, and achieved an excellent performance (AUC, 0.94; accuracy, 0.84; sensitivity, 0.89; specificity, 0.75). The ANN model validation analysis confirmed the model's robustness (AUC, 0.81; accuracy, 0.83; sensitivity, 0.71; specificity, 0.94).

Conclusion: This study identifies, for the first time, a microRNA signature capable of predicting rapid structural progression in knee OA patients. The model demonstrated strong performance and was validated in an independent cohort, showcasing its potential for generalization. The translational potential of this prediction model is significant, as it will provide clinicians with a valuable tool for personalized and targeted treatment strategies as well as assist early identification of high-risk structural progressor patients for inclusion in trials.

[1]Jamshidi A, et al. *Ther Adv Musculoskelet Dis* 2020;12:1-12.

P701

PROFILE OF PATIENTS ON TREATMENT WITH ABALOPARATIDE IN CLINICAL PRACTICE: SHORT-TERM ADHERENCE AND SAFETY

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Background Although clinical practice guidelines are available for initiating anti-osteoporotic treatment in patients at risk of fracture, their implementation in clinical practice is variable. On the other hand, adverse effects often appear in the first weeks of treatment, leading to its discontinuation. Abaloparatide (ABL) is a drug approved in May 2024 in our country for the treatment of postmenopausal osteoporosis (OP), so real-life experience is very limited yet.

Objectives To investigate the clinical profile of OP patients initiating ABL in real life, as well as to assess their adherence and safety in the short term.

Methods Observational, retrospective, multicenter study. Postmenopausal women with OP who initiated ABL between June and December 2024 were included. Demographic data, clinical risk factors for OP, previous anti-osteoporotic treatments, bone densitometry, laboratory data, reason for treatment with ABL, as well as side effects and adherence to treatment at 3 months, were collected. A simple descriptive analysis of the variables studied was performed.

Results A total of 69 women from 5 centers (4 rheumatology and one geriatrics department) were included in the analysis. The mean (SD) age was 73 (8.79) years. Twenty-nine (42%) patients had had previous fractures, and 62% of them had received treatment. The ABL was the first line of treatment in 68.1% of cases. The most frequent reason for initiating ABL was the presence of fractures in the previous year in 72.4% of patients, 68% in the lumbar spine, 64.7% of which were multiple, 13 in the hip, 2 in the pelvis and 4 in the shoulder. The second reason for prescribing ABL was very low bone mineral density (BMD (T ≤ -3.0)) in 71.6% of patients. A total of 43 patients completed the 3 months follow-up up to December 2024, of whom 6 (13.9%) presented adverse effects (myalgia), leading to ABL discontinuation in 5 patients (Table).

Conclusions Patients initiating ABL had a very high-risk OP due to recent fractures and/or very low BMD. ABL was the first anti-osteoporotic treatment in most patients. The safety profile was optimal and the persistence rate at 3 months was high.

Table. Demographic, Clinical, and Treatment Characteristics of Patients

	Total n=69
Age, years, mean (SD)	73.65 (8.79)
BMI, mean (SD)	25.20 (4.62)
Current smoking, n (%)	12 (17.3)
Alcohol use, n (%)	1 (1.4)
Secondary OP, n (%)	10 (14.4)
Parent hip fracture, n (%)	13 (18.8)
Patients with previous fractures, n (%) · Lumbar spine · Hip · Shoulder · Others	29 (42) 16 (55.1) 5 (17.2) 4 (13.7) 12 (41.3)
Previous anti-osteoporotic treatment, n (%) · Bisphosphonates · Denosumab · Bisphosphonates + Denosumab · Others	18 (62) 17 (94.4) 7 (38.8) 4 (22.2) 4 (22.2)
Lumbar spine T-score, mean (SD)	-3,28 (1.18)
Femoral neck T score, mean (SD)	-2,73 (0.87)
Indication abaloparatide · First line, n (%) · Second line, n (%) · Third or more, n (%)	 47 (68.1) 18 (26) 4 (5.7)
Reason for prescribing ABL	
Fractures, n (%) · Lumbar spine. Multiples · Hip · Pelvis · Shoulder	50 (72.4) 34 (68). 22 (64.7) 13 (18.84) 2 (2.9) 4 (5.8)
Bone mineral density, Tscore ≤3, n (%) · Lumbar spine · Femoral neck	48 (71.6) 38 (64.4) 27 (45.7)
Fractures + BMD Tscore ≤3, n (%)	32 (46.3)
Contraindication to other treatments, n (%)	5 (7.2)
Adverse effects of other treatments, n (%)	3 (4.3)
Adverse events (n=43), n (%)	6 (13.9)
Discontinuation of treatment due to adverse events (n=43), n (%)	5 (11.6)

P703

FACTORS AFFECTING SERUM OSTEOCALCIN CONCENTRATION IN POLISH COHORT OF CHILDREN WITH OSTEOGENESIS IMPERFECTA – A SINGLE-CENTER OBSERVATIONAL RETROSPECTIVE STUDY

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Osteogenesis imperfecta is a rare bone dysplasia occurring in 1/15,000–20,000 births, characterized by reduced bone mineral density, growth deficiency, and an increased risk of fractures throughout a patient's life. The clinical manifestation of OI usually includes additional features of connective tissue disorders.

The aim of this study was to analyze the factors that may influence serum osteocalcin levels in children with osteogenesis imperfecta treated with intravenous sodium pamidronate.

The study included 61 patients diagnosed with osteogenesis imperfecta type 1 or 3, aged 2 to 18, hospitalized for intravenous sodium pamidronate administration. A retrospective analysis of medical records was conducted, collecting information on age, sex, body weight, height, the number of long bone fractures throughout life, serum levels of osteocalcin, creatinine, alkaline phosphatase, 25(OH)D3, and DXA BMD z-scores for the L1-L4 spine segment.

The z-score for osteocalcin levels differed significantly depending on the type of osteogenesis imperfecta and was statistically correlated with fracture rate, serum alkaline phosphatase z-score, BMD z-score for L1-L4, and height and weight percentiles. In both univariate and multivariate linear regression models, the strongest predictor of osteocalcin z-score was the type of osteogenesis imperfecta, with BMD L1-L4 z-score also being significant factor.

The concentration of osteocalcin varies differs between types 1 and 3 of osteogenesis imperfecta. Type of OI has the strongest effect on OC concentrations of all the parameters studied.

P704

SELECTED ABNORMALITIES OF SOMATIC DEVELOPMENT IN POLISH CHILDREN WITH OSTEOGENESIS IMPERFECTA – A SINGLE-CENTRE RETROSPECTIVE COHORT STUDY

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Osteogenesis imperfecta (OI) causes a number of abnormalities in somatic development. The predominant symptoms are reduced bone mass and an increased risk of fractures as well as bone deformities and short stature. Due to the lack of causal treatment options, bisphosphonates are considered the gold standard of

therapy.
The aim of our study is to present selected anthropometric parameters (body weight, height, BMI) in children with type I and III of OI.
We performed a retrospective analysis of medical records of patients with osteogenesis imperfecta type I and III confirmed by genetic testing. The study group included individuals admitted to the Department in 2020. We analysed the anthropometric parameters of 108 children (receiving and not receiving bisphosphonates treatment).
In the group of children with OI type I admitted for follow-up (group 1), the median height percentile was 37, while in the group 2 it was 17. In the patients with OI type III (group 3), the median height percentile was 0.1. The median body mass percentile in group 1 was 21, in group 2 it was 5, whereas in group 3 - 0.1. The differences in anthropometric measurements of the patients with OI type I and OI type III were statistically significant ($p<0.001$).
Among the analysed patients, an abnormal BMI was found in 41.67% of whom 37.78% were underweight, 48.89% were overweight and 13.33% were obese.
Considering prevalence of the disease, it is not only low stature but also abnormal BMI, and especially excessive body weight, that play an important role in the somatic development disorder.

P705

EXPERT AND REHABILITATION ASSESSMENT OF ATAXIA IN PATIENTS WITH CEREBROVASCULAR ACCIDENTS

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A method for expert-rehabilitation assessment of the presence and severity of coordination disorders (ataxia) in patients with cerebrovascular accidents has been developed. A clinical and functional assessment of the health status of 72 patients with ataxic disorders caused by circulatory disorders in the vertebrobasilar basin (VBB) was conducted: 58 (80.6%) men and 14 (19.4%) women. By the duration of the disease, the examined individuals were distributed as follows: up to one year - 10 people. (13.9%); from 1 year to 3 years - 27 people. (37.5%); from 3 to 10 years - 23 people. (31.9%); more than 10 years - 12 people. (16.7%). Statodynamic disturbances in patients with cerebrovascular accidents were manifested in the form of ataxia of varying severity (72 patients; 100.0%): mild in 34 patients (47.2%), moderate in 29 patients (40.3%), and severe disturbances in 9 patients (12.5%).
The following groups of methods were used to assess coordination disorders and the resulting limitations of life activities: interviewing and analysis of subjective manifestations (complaints); analysis of anamnestic data presented in the medical documentation; examination and assessment of cranial nerves; examination and assessment of muscle tone; examination and assessment of postural stability; examination and assessment of simple sensorimotor reactions; examination and assessment of complex sensorimotor reactions using Schilder, Stuart-Holmes, and diadochokinesis tests; examination and assessment of static coordination of the upper and lower limbs; examination and assessment of dynamic coupled coordination of the trunk, upper and lower limbs; biomechanical assessment of gait function; examination and assessment of simple and complex types of sensitivity: pain and temperature, muscle-joint, vibration, two-dimensional-spatial, stereognosis; examination and assessment of brain structures using CT and MRI; assessment of the coordination sphere using computer stabilometry; hemodynamic study using ultrasound diagnostics of the brachiocephalic vessels; balance assessment under stress tests using the Berg Balance Scale; gait function assessment using the Dynamic Gait Index; assessment of daily living motor activity with risk of falls using the M. Tinnetti Falls Effectiveness Scale; assessment of functional independence (self-care ability) using the Functional Independence Measure (FIM); assessment of patient mobility (ability to move) using the Rivermead Mobility Index.

P706

DETERMINATION OF THE ABILITY TO CHANGE AND MAINTAIN BODY POSITION IN PATIENTS WITH POST-STROKE ATAXIA IN THE PRACTICE OF MEDICAL REHABILITATION

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A clinical and functional assessment of the health status of 72 patients with ataxia caused by vertebrobasilar circulation disorders was performed: 58 (80.6%) men and 14 (19.4%) women. According to the duration of the disease, the examined individuals were distributed as follows: up to one year – 10 people (13.9%); from 1 year to 3 years – 27 people (37.5%); from 3 to 10 years – 23 people (31.9%); more than 10 years – 12 people (16.7%). Statodynamic disorders in patients with CCI were manifested in the form of ataxia of varying severity (72 people; 100.0%): mild in 34 people (47.2%), severe in 29 people (38.5%), and severe in 36 people (38.5%). (40.3%) moderate and 9 patients (12.5%) had severe disorders.
Determination of the ability to change and maintain body position (using ICF) included assessment by categories: d410 (change of body posture), d415 (maintenance of body posture), d420 (body movement). Assessment of the ability to change body posture (d410) was carried out on the basis of the analysis of the ability to adopt and change body position with the implementation of body movement: turning on the side, rising from a lying position to a sitting position, rising from a sitting position to a standing position and back, rising from a chair to lie down in bed, squatting, rising from a squatting or kneeling position to a sitting and standing position, the ability to bend the body and move the center of gravity.
A rehabilitation assessment was performed on 29 patients with moderate ataxia. It was found that when assessing the ability to change body posture (d410), turning from back to stomach, taking positions (sitting, standing), rising from a squatting or kneel-

ing position to a sitting and standing position was performed by the patient with the help of additional efforts of the muscles of the lower limbs, trunk with additional support with the hands, at a slow pace and uncertainly, when taking a vertical posture, the joints were fixed in a combined active-passive manner. The ability to maintain stability when bending the body was moderately limited. When assessing the ability to maintain body position (d415), it was found that maintaining body position in a standing position is difficult for most patients and requires additional support, maintaining an elevated position of the upper body in a sitting position is carried out with the help of the trunk muscles and partial support with the hands. The ability to maintain body position in a squatting position is difficult: no more than 2 minutes and with support on the hands. Long-term holding of a standing position during everyday movements is accomplished with the help of a cane.

The assessment of body movement (d420) showed that in a sitting position, movement within surfaces of the same level (from a bed to a chair, without changing the body posture), between surfaces of different levels is carried out independently with a longer time expenditure, additional support is used with the use of hands, when repeating movements, the ability is preserved, but with a loss of pace.

The problems and limitations of the ability to change and maintain body position identified in patients were used to form a rehabilitation diagnosis and to set rehabilitation tasks for specialists of the multidisciplinary rehabilitation team.

P707

HISTOLOGICAL ANALYSIS OF BONE RESORPTION, COLLAGEN FIBERS AND TRAP OF EXPERIMENTAL PROTOCOL OF ACUTE AND CHRONIC STRESSORS IN SPONTANEOUSLY HYPERTENSIVE RATS IN LONG BONES

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Arterial Hypertension (AH) is part of the group of cardiovascular diseases that represent the highest percentage of causes of mortality. Evidence suggests that psychosocial factors may play an important role in the development of high blood pressure. Exposure to chronic stress has been considered a risk factor for this chronic disease. *Objective*: Therefore, this study aims to investigate the effect of varied acute and chronic stress associated with hypertension on the skeletal system, through morphofunctional and metabolic assessments (Histology and Immunohistochemistry). *Material and Methods*: Male Hannover rats (n=40) and SHR rats (*Spontaneous Hypertensive Rats*) (n=40) were used, randomly divided into groups G1 (no stress/normal rat); G2 (no stress/SHR rat); G3 (control/acute stress/normal rat); G4 (acute stress/normal rat); G5 (control/acute stress/SHR rat); G6 (acute stress/SHR rat); G7 (control/chronic stress/normal rat); G8 (chronic stress/normal rat); G9 (control/chronic stress/SHR rat); and, G10 (chronic stress/SHR rat). The rats were euthanized on the 10th day after the start of the experiment, to obtain tibias for histological and immunohistochemical analyzes of bone resorption, collagen fibers and TRAP. *Results*: Regarding the histology of bone resorption, staining was performed with Masson's Trichrome and quantification using a light microscope coupled to a digital camera, Axioimager Z2 Zeiss and AxioVision 4.8 software (Carl Zeiss, Oberkochen, Germany). Kruskal-Wallis was used to compare controls for the same type of animal. No significant differences were found: Normal (p=0.077) and SHR (=0.123). The Wald Test was performed in a generalized linear model to compare groups G4 to G10, in which no significant differences were identified between the types of rats (p=0.203) and stress/handling (p=0.157) and no interaction Type of rat versus stress/ manipulation (p=0.420). A trend towards increased area was observed in the manipulated control groups, for both types of rats. Regarding collagen fibers, staining with Picro Sirus Red was used and images were captured using a light microscope coupled to a digital camera, Axioimager Z2 Zeiss and AxioVision 4.8 software (Carl Zeiss, Oberkochen, Germany). Kruskal-Wallis was used to compare control groups for the same type of animal. No significant differences were found: Proximal Picro - Normal (p=0.298) and SHR (=0.735); Proximal Picro - Normal (p=0.098) and SHR (=0.077). The variation of the control groups of SHR rats in the proximal regions: G2, G5 and G9. The highest average was found in group G9 (10-day manipulation for chronic stress - control). TRAP enzymatic activity was analyzed histochemical in bone focusing on the proximal regions (distal and proximal). The TRAP reaction was observed in the groups that suffered stress with the presence of a reddish-pink color. In other words, there was a reaction in the groups with the acute stress protocol (G4 and G6) and in the groups with the chronic stress protocol (G8 and G10). The Wald Test was performed in a generalized linear model to compare groups G4, G6, G8 and G10, in which no significant differences were identified between the types of rats (p=0.616) and stress/handling (p=0.501) and no interaction Type of rat versus stress/handling (p=0.923). The highest average % Area in the number of TRAP-positive osteoclasts per mm of bone surface was observed in the G6 group compared to the other groups. *Conclusion*: With the results, we conclude that the experimental protocol of chronic and acute stress is effective in associating bone resorption with emotional stress and arterial hypertension. Other analyzes should be considered to complement the effectiveness of the protocol and we can also suggest increasing the days of the experimental protocol. *Acknowledgments*: Acknowledgments to FAPESP (*Fundação de Amparo à Pesquisa do Estado de São Paulo*) for funding and research support related to the Regular Project (2023/06853-7), Doctorate (2021/08618-0) and Research Internship Abroad (2024/02633-5) processes.

Key Words: Hypertension, Psychological Stress, Tibia, Bone Resorption, Histology, Collagen fibers, TRAP.

P708

IMMUNOHISTOCHEMICAL ANALYSIS OF VEGF, TRAP, SIALOPROTEIN AND OSTEOCALCIN IN THE EFFECTIVENESS OF THE EXPERIMENTAL PROTOCOL OF ACUTE AND CHRONIC STRESS ASSOCIATED WITH ARTERIAL HYPERTENSION ON THE MORPHOFUNCTIONAL CHARACTERISTICS OF LONG BONES

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The prevalence of chronic disorders, high blood pressure and bone pathologies, as well as emotional disorders, such as stress, in the general population, requires studies on these topics, with the intention of better understanding the physiological and morphological aspects and biochemicals altered under these conditions. *Objective*: the main objective of the present study is to characterize the efficiency of the experimental protocol of varied acute and chronic stress associated with arterial hypertension on the skeletal system through a qualitative immunohistochemical analysis of the factors TRAP, VEGF, Sialoprotein and Osteocalcin. *Material and Methods*: All experimental protocols were carried out in accordance with the Local Ethics Committee for the Use of Animals of the University of São Paulo/Brazil, of the School of Dentistry of Ribeirão Preto, registered with number 0027/2021R2. Male Hannover rats (n=40) and SHR (spontaneous hypertensive rats) (n=40) were used. The animals were randomly divided into three large groups: control group without stress; group with acute stress; group with varied chronic stress. Each group was subdivided into normal rats and spontaneously hypertensive rats: G1 (no stress/normal rat); G2 (no stress/SHR rat); G3 (control/acute stress/normal rat); G4 (acute stress/normal rat); G5 (control/acute stress/SHR rat); G6 (acute stress/SHR rat); G7 (control/chronic stress/normal rat); G8 (chronic stress/normal rat); G9 (control/chronic stress/SHR rat); and, G10 (chronic stress/SHR rat). Regarding the acute stress protocol, the animals were subjected to a single episode of stress protocol (acute stress for 2 hours – physical restriction), followed by euthanasia. In the varied chronic stress protocol, the animals underwent 5 different types of stress for a period of 10 days, followed by euthanasia. Each day the animal went through a type of stress: day 1 and 6 were stress due to agitation; days 2 and 7 were stress due to forced swimming; days 3 and 8 were stress due to physical restriction; day 4 and 9 were cold stress; and day 5 and 10 were stress due to water deprivation. After euthanasia of the animals, the right tibia was collected and the samples were processed for qualitative analyzes of TRAP, VEGF, Sialoprotein and Osteocalcin. *Results*: in a qualitative immunoanalysis of histological images through captured images captured using a light microscope coupled to a digital camera, Axioimager Z2 Zeiss and AxioVision 4.8 software (Carl Zeiss, Oberkochen, Germany) it was observed that TRAP reactions (reaction enzymatic analysis of osteoclasts) occurred only in the groups that experienced acute and chronic stress (G4, G6, G8 and G10). The presence of the VEGF, Sialoprotein and Osteoclacin reaction was more intense in the groups that went through acute and chronic stress (G4, G6, G8 and G10), demonstrating that there was a bone remodeling process. Conclusion: with the results we conclude that the Experimental Protocol is efficient in demonstrating bone resorption among groups that have experienced acute and chronic stress. However, only with a qualitative analysis the relationship between stress and high blood pressure and bone resorption is limited, justifying other possible complementary analyses. *Acknowledgments*: Acknowledgments to FAPESP (*Fundação de Amparo à Pesquisa do Estado de São Paulo*) for funding and research support related to the Regular Project (2023/06853-7), Doctorate (2021/08618-0) and Research Internship Abroad (2024/02633-5) processes.

Key Words: Hypertension, Psychological Stress, Bone Resorption, Immunohistochemistry, TRAP, VEGF, Sialoprotein, Osteocalcin.

P709

ANALYSIS OF CYTOKINE AND MMP GENE EXPRESSION IN BONE REMODELING ENHANCED BY MELATONIN AND RHBMP-2

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New therapies for treating significant bone defects are needed in medicine and destistry. Melatonin could play a key role in bone remodeling, while growth factors might boost the repair process. Objective: To assess the expression of cytokine genes (IL-1β, IL-6, IL-10, and TNF-α), osteoclastogenesis markers (RANK, RANKL, and OPG), and MMPs (MMP-1, MMP-2, MMP-8, and MMP-13) following treatment with melatonin combined with an osteogenic membrane and rhBMP-2 in bone injury recovery. Material and Methods: Sixty-four rats were allocated into 9 experimental groups based on the treatment applied to the bone lesion area, with melatonin concentrations of 1, 10, and 100 µmol/L. Gene expression was analyzed using real-time PCR, which involved measuring total RNA concentration and performing reverse transcription. To investigate the isolated and synergistic osteogenic potential of melatonin on the recovery of calvarial bone injury, the animals were distributed into 8 experimental groups, with 8 animals each. Melatonin (1, 10 and 100 µM), bone morpho- genetic protein (5 µg BMP-2) and osteogenic membrane in the form of a sponge or scaffold (Lumina-Coat Criteria®) were applied bilaterally to each animal, and the experimental groups were formed according to according to the treatment carried out in the region of the bone lesion, as shown in the table below.
Results: There were differences between groups when compared with clot or scaffold control, and improvement with a higher con-

centration of melatonin or rhBMP-2. The combination melatonin (1 µg) with 5 µg of rhBMP-2, using the guided bone regeneration technique, demonstrated some effects, albeit mild, on bone repair of critical bone defects. Conclusion: This indicates that the approach for administering these substances needs to be reassessed, with the goal of ensuring their direct application to the affected area. Therefore, future research must be carried out, seeking to produce materials with these ideal characteristics. *Acknowledgments*: Acknowledgments to FAPESP (*Fundação de Amparo à Pesquisa do Estado de São Paulo*) for funding and research support related to the Regular Project.

Key Words: Bone repair; Melatonin; Gene expression; RhBMP-2; Scaffold; Tissue engineering; Guided bone regeneration

P710

THE RELATIONSHIP BETWEEN BARIATRIC SURGERY AND RISK OF TOTAL HIP OR KNEE REPLACEMENT IN SEVERE OSTEOARTHRITIS IS OBESITY CLASS-SPECIFIC

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Background: In patients with osteoarthritis (OA), bariatric surgery is associated with diminished joint pain and improved functionality. The purpose of the study was to evaluate the relationship between the risk of total joint replacement (TJR) and the fact of having undergone bariatric surgery (yes/no) in people living with obesity (PwO).
Methods: This case-control study was conducted using data from the French National Hospitals Database to identify hospitalizations for TJR. The main exposure of interest was having undergone (or not) a bariatric surgery procedure between January 2017 and December 2021. After a 6-month run-in phase, data on hospitalizations for the first TJR (i.e., hip or knee) from July 2017 to December 2023 were classified by obesity class and surgical type.
Results: 160,773 patients who had undergone bariatric surgery (mean age 40.8 years, 79.5% female) and 160,773 matched controls were identified. The most frequent surgical technique was sleeve gastrectomy (72.2%), followed by gastric bypass (27.8%). Average follow-up was 4.7 years. An increase in the overall risk of TJR, with a hazard ratio (HR) of 1.09 (95% confidence interval (CI), 1.03–1.15), was observed. Depending on obesity class, patients with BMI < 40 kg/m² had a lower risk of TJR (HR=0.85, 95% CI, 0.78–0.93), whereas a higher risk was observed in patients with BMI ≥ 40 kg/m² (HR=1.25, 95% CI, 1.16–1.34).
Conclusions: In France, hospitalizations for TJR following bariatric surgery increased by 25% in patients with BMI ≥ 40 kg/m², whereas it decreased by 15% in patients with BMI < 40 kg/m².

P711

COMPARATIVE EPIDEMIOLOGICAL STUDY OF HIP FRAGILITY FRACTURES BETWEEN TWO LEVEL 3 HOSPITALS

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Introduction Current study aims to investigate the epidemiology of extracapsular hip fractures at the *Río Hortega Hospital* and the *University Clinical Hospital* de Valladolid (Spain)
Material and Methods A retrospective epidemiological study was carried out covering cases recorded between 2019 and 2021 in both hospitals. The parameters of age, sex, laterality and seasonality were analyzed in the sample of patients included in the study. Finally, a statistical analysis of the sample was performed with the SPSS program.
Results
- *Total Data:*
A total of 930 patients were included.
The cumulative incidence of 152 cases per 100,000 inhabitants.
The average age was 85.3 years
With a predominance of the female gender (73.2%) at the expense of the age group 70-79 and 80-89 years
Frequency in the left lower limb (51.4%), non-significant difference.
The seasonal distribution was similar throughout the year with a higher incidence in winter: spring (23.7%), summer (24.9%), autumn (24.7%) and winter (26.8%).
- *Río Hortega Hospital*
507 patients were operated on
Cumulative incidence of 194 cases per 100,000 inhabitants
Average age of 85.7 years
Predominance of the female gender (74%). The mean age of women was 86.6 years and that of men 82.9 years.
50% of the pertrochanteric hip fractures occurred in the left lower limb
Seasonal distribution: spring 26.8%, summer 22.3%, autumn 22.1%, winter 28.8%
- *University Clinical Hospital*
423 patients were operated on
Cumulative incidence of 121 cases per 100,000 inhabitants
Mean age of 84.9 years
Predominantly female (73%). The mean age of women was 85.8 years and that of men 83.9 years.
52.7% of the fractures occurred in the left lower limb
Seasonality: spring 19.9%, summer 28%, autumn 27.7%, winter 24.4%.
Conclusions
- There is a high prevalence of extracapsular hip fractures in elderly patients and mainly in women.
- There is a higher incidence in winter and there are no significant variations between laterality
- The Río Hortega Hospital has a higher number of extracapsular fractures than the Clinical Hospital

- The rest of the variables studied are comparable in both hospitals.
- These findings may be useful for establishing preventive measures and guiding future research.

P712

IMPORTANCE OF FLS UNIT FOR CLOSE UP FOLLOW-UP AND ADHERENCE TO OSTEOPOROSIS TREATMENT, A CASE REPORT

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Objectives: To highlight the importance of screening for secondary osteoporosis and fragility fractures and the need for FLS (Fracture Liaison Service) units for early diagnosis and treatment.
Material and Methods: Clinical case study of secondary osteoporosis in an FLS consultation. A 28-year-old male patient with no known drug allergies.
Personal background:

- *Cardiovascular Risk Factors: type I DM with microvascular complications: Diabetic retinopathy and Diabetic axonal polyneuropathy (DNP). Smoker.*
- *Osteochondral fracture of the patella in right knee, 2010.*
- *Righ*t hip acetabulum fracture in 2017 after fall from his own height.

The patient was referred from the Endocrinology service after a fragility fracture and the finding of osteoporosis in a densitometry (DXA) performed in July 2024. The patient developed DM in 2010, since then, he has had poor metabolic control despite being treated with different types of insulin. He started on cholecalciferol 25,000 IU monthly in 2021 as prescribed by his endocrinologist. Since his DM onset he has had two episodes of fragility fracture.
Results: During the first visit to FLS (October 2024), the tests carried out were evaluated: DXA with T-Score lumbar spine -3.5 and T-Score femoral neck -3.6. A bone metabolism blood test was requested with values of PTH 47.2 pg/mL, Ca 10 mg/dL, Vit D (25 OH) 28.4 ng/mL and FA 130 U/L. After the results obtained, it was proposed to start treatment with osteoanabolic therapy because of the very high risk of fracture: *Abaloparatida*, but the patient refused for economic reasons. On the second visit to FLS (December 2024) it was proposed to start with *Romozosumab* after ruling out cardiovascular risk factors, but the visa was denied. It should be noted that, in Spain, a visa is required to start this type of treatment. Finally, *Zoledronic Acid* has been proposed for initiation, but she is waiting for a dental surgery and has not yet started treatment.
Conclusions: The causes of secondary osteoporosis require special attention and should be assessed in FLS units that carry out a correct diagnosis and treatment in order to prevent fractures. We should highlight the difficulty in some cases to access optimal treatment.
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P713

OSTEOPOROSIS ASSESSMENT BY BONE DENSITY MEASUREMENT IN HOUNSFIELD UNITS IN LUMBAR AND FEMORAL NATIVE CT SCANS: A COMPARISON WITH QCT AND CTXA

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Objective:
This study investigates the extent to which osteoporosis assessment is feasible through density measurement in Hounsfield Units (HU) and explores if HU values can be used to calculate quantitative BMD values.
Material and Methods:
A total of 240 patients, with an average age of 64.9 ± 13.1 years and a body mass index of 26.8 ± 6.8 kg/m², were examined for osteoporosis. For the spine, BMD in mg/cm³ was determined by QCT at L1, L2, and L3 vertebrae. Additionally, trabecular density in HU was measured in the same vertebrae, using a ellipsoid ROI positioned within the mid-vertebral spongy area in sagittal CT images. For the hip region, BMD in mg/cm² and DEXA-equivalent T-scores were quantitatively determined via CTXA. In the coronal CT image, trabecular density in HU was measured in the femoral head, neck, and subtrochanteric regions using circular ROIs.
Results:
For the spine, the median BMD was 73.2 (57.05–104.17) mg/cm³, and the median HU was 89.93 (67.90–126.95). With a correlation of 0.978 ($p < 0.001$), quantitative values in mg/cm³ can be calculated using the following formula: Xqct=0,83+0,81×HU (Fig. 1).

For the hip region, the median BMD was 0.684 (0.306–1.368) mg/cm², and the median HU was 125.68 (-11.93–308.67). With a correlation of R^2=0.8998 ($p < 0.001$), quantitative values in mg/cm² can be derived using the following formula: Xctxa=0,364+0,0027 ×HU (Fig. 2). The median T-score was -2.06 (-5.15–3.78), and with a correlation of R^2=0.9075 ($p < 0.001$), the values can be calculated by the formula: Xt=-4,8717+0,0234×HU (Fig. 3). Here, a T-score of -2.5 corresponds to an HU value of 101.35.

Conclusions:

Trabecular density measurements in HU can be converted into quantitative BMD values for the axial skeleton (mg/cm³) and the hip (mg/cm²), enabling a reliable estimation of osteoporosis. In our cohort, a trabecular density of less than 100 HU indicates the threshold for osteoporosis.

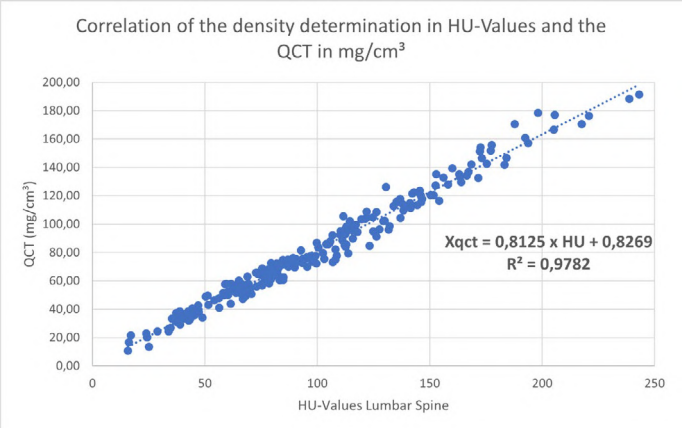

Fig. 1

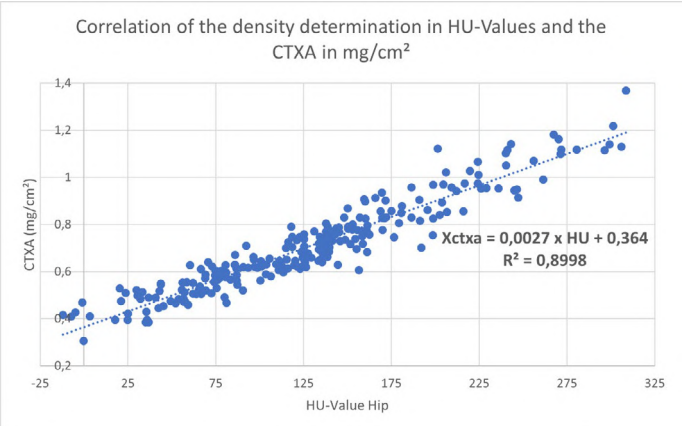

Fig. 2

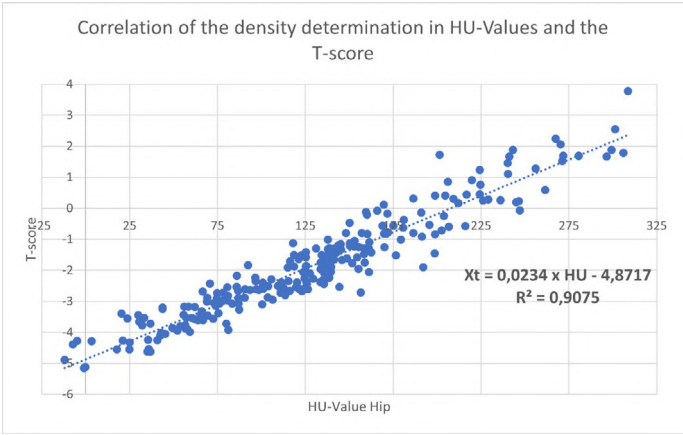

Fig. 3

P715

SERUM 25-HYDROXYVITAMIN D IN OSTEOPOROSIS WOMEN OF TAIWAN

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Objectives: The aim of this research study was to assess the vitamin D in postmenopausal osteoporosis women with and without vertebrae or hip fractures in Taiwan.

Background, study design and methods:Osteoporosis is a progressive systemic bone disease characterized by low bone mass and microarchitecture deterioration of bone tissue, leading to increased bone fragility and susceptibility to fracture. It is a major public health problem in many countries, as well as in Taiwan. Among the osteoporosis management factors, vitamin D plays an important role. Vitamin D is absorbed from food or synthesized in skin that is exposed to sunlight. The liver converts it to 25-hydroxyvitamin D [25(OH)D], which in turn is converted by the kidney to active form calcitriol 1,25(OH)2D. Vitamin D increases serum calcium by promoting intestinal calcium absorption and plays a role in bone formation and resorption. Synthesis of 1,25-dihydroxy vitamin D is stimulated by both PTH and hypophosphatemia. In addition, vitamin D deficiency is associated with muscle weakness and postural instability, leading to an increased risk of falls, which may lead to fractures.

This single center observational study analyzed the vitamin D level in Taiwanese postmenopausal osteoporotic patients with and without non- trauma fragility vertebral or hip fracture that received post-fracture medical care at osteoporosis clinic. A single, non-fasting blood sample to assess 25(OH)D and biochemical tests were performed in the study visit. Vitamin D inadequacy was defined as serum 25(OH)D level less than 30 ng/mL and deficiency as less than 10 ng/mL.

Results: A total of 72 patients were enrolled at Chang Gung Hospital, in Linko, Taiwan. Overall, the average age was 70.8 years. The mean years since menopause were 21.3 years. The mean serum 25(OH) D level was 26.6±8.2 ng/mL, and lower vitamin D level

25.7±7.8 ng/mL in 34 (47%) patients with hip and vertebral fractures, compared with 27.8±8.9 ng/mL in 38 (53%) patients without fractures, resulting in a prevalence of vitamin D inadequacy of 65% of patients.
Conclusions: International Osteoporosis Foundation recommends that a minimum level of 30 ng/mL 25(OH)D is necessary in older adults to reduce the risk of falls and fractures. The results of this study have shown high prevalence of vitamin D inadequacy was found among osteoporosis women with and without vertebrae or hip fractures in northern Taiwan. Recommendations and education for postmenopausal women with osteoporosis to receive adequate vitamin D supplementation should be reinforced.
Keywords: vitamin D, osteoporosis, fracture

P716

PERIOPERATIVE HYPOVITAMINOSIS D AFFECT THE FUNCTIONAL OUTCOMES AFTER SURGERY IN FRAGILITY HIP FRACTURES

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Objectives: This study aimed to evaluate the association between serum 25-hydroxyvitamin D levels and functional outcomes, measured by the Barthel Index, at one year after fragility hip surgery. Secondary objectives included comparing quality of life, incidence of refractures, and mortality within one year between patients with lower versus higher vitamin D levels.
Materials and Methods: A retrospective analysis was conducted on patients aged ≥50 years who underwent hip surgery for fragility fractures at Siriraj Hospital (2017–2021) with recorded perioperative serum 25-hydroxyvitamin D levels. Patients with pathological or multiple fractures or prior hip surgery were excluded. Hypovitaminosis D was defined as serum 25-hydroxyvitamin D <20 ng/ml. Functional recovery was assessed using the validated Thai version of the Barthel Index, with scores ≥80 indicating good outcomes. Associations between hypovitaminosis D and functional outcomes were analyzed using univariate and multivariate models.
Results: Among 534 patients, 51.5% had hypovitaminosis D. These patients demonstrated significantly lower Barthel Index and EQ-VAS scores at one year post-surgery, indicating poorer functional outcomes and quality of life. However, no significant differences were observed in refracture rates or mortality within one year between groups.
Conclusions: Perioperative hypovitaminosis D is associated with poorer functional recovery and quality of life in fragility hip fracture patients. Screening and optimizing vitamin D levels in osteoporosis patients may improve postoperative outcomes.
Acknowledgements: The authors thank the medical and nursing staff at Siriraj Hospital and Ms. Wachirapan Narktang and Ms. Panisa Khaminta for their assistance with data collection and statistical analysis.
Disclosures: The authors declare no conflicts of interest and received no external funding for this study.

P717

HOW DO WE ADDRESS VITAMIN D DEFICIENCY AMONG PATIENTS HOSPITALIZED IN THE INTERNAL MEDICINE DEPARTMENT? A RETROSPECTIVE OBSERVATIONAL STUDY FROM SLOVAKIA

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Objective: Current guidelines for vitamin D supplementation differ in defining deficiency thresholds and optimal dosing, thus creating confusion among physicians about the best approach.
Material and methods: In the monitored period from January 2018 to December 2023, health records of 18,076 hospitalized patients were assessed for serum 25(OH)D levels at the time of hospital admission and for vitamin D prescription among patients with deficiency upon hospital discharge. Analysis was made for the whole cohort, and comparisons were also made between the pre-COVID-19 years (2018-2019), the peak of the pandemic (2020-2021), and post-pandemic years (2022-2023). Vitamin D deficiency was defined as a serum 25(OH)D concentration < 20 ng/mL.
Results: The mean 25(OH)D concentration in hospitalized patients (n=6915) during the observed period was 18.05 ± 11.24 ng/mL. 5725 (83%) of patients were discharged, and 1163 (17%) died in the hospital. Of discharged patients, 3461 (60%) were vitamin D deficient. Of them, 1188 (34%) received supplementation with vitamin D at the time of discharge. The number of patients with identified vitamin D deficiency and prescribed supplementation did not reach 50% in any year of the monitored period. There was a significant difference between men and women regarding vitamin D prescription (29% vs 40%, p<0.001). 987 (83%) of patients received cholecalciferol and 209 (17%) alfacalcidol. In patients with cholecalciferol prescription, 798 (72%) received a daily and 279 (28%) weekly dosage schemes. The mean calculated daily dose of cholecalciferol in patients with a daily dosage scheme was 2563 ± 2023 IU compared to 1433 ± 606 IU in a weekly dosage scheme (p<0.001). At the beginning of the observation period (2018-2019), the mean prescribed daily dose of cholecalciferol was higher in men than in women (1671 ± 1463 IU and 1294 ± 918 IU, respectively, p=0.03). At the end of the observation period (2022-2023), women were prescribed higher doses than men (2550 ± 1571 IU and 2153 ± 1227 IU, respectively, p=0.01).
Conclusion: Vitamin D supplementation is highly heterogeneous. Physicians often don't reflect vitamin D status, and only one-third of patients with identified vitamin D deficiency are addressed upon hospital discharge.

P718

UNDIAGNOSED VERTEBRAL FRACTURES IN ROUTINE CT SCANS - HAVE WE LEARNED OUR LESSON?

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Objective

Vertebral fractures (vFXs) are the most common type of osteoporotic fracture. However, only one third of them occur acutely and therefore come to immediate clinical attention, while the majority remains clinically unrecognized and undiagnosed although present in different radiological modalities (1,2,3). In the early two-thousands, the International Osteoporosis Foundation (IOF) launched a global educational program, called "Vertebral Fracture Initiative", to improve awareness of healthcare professionals for vFXs . The aim of the present study was to evaluate if this global initiative has led to a sustainable improvement in the reporting and diagnosis of vFXs present in chest and abdominal/pelvic CT scans.

Material and Methods

The study included all CT scans of the chest or abdomen/pelvis that were performed between January 1st, 2023 to December 31st, 2023 in patients ≥ 50yrs (n = 8,500) at a large university hospital. A random sample of 1,500 CT scans from 1,380 patients was included in the analysis. Two board-certified radiologists independently reviewed each scan for vFXs, noting the number, location, and type of fracture. Severity of fracture was classified by visual semi-quantitative assessment according to the Genant classification (Grades 2 and 3). Inter-rater agreement was assessed using Kappa coefficient and AC1 statistic. Fracture documentation rates were calculated based on whether fractures were noted in the diagnostic summary of the report, or in the free-text narrative. Stratified analysis was performed by patient gender, fracture location, and the presence of multiple fractures.

Results

The prevalence of vertebral fractures was 11.5%. Inter-rater agreement was excellent, with a Kappa value of 0.94 (95% CI: 0.92–0.97) and an AC1 of 0.99 (95% CI: 0.98–0.99). However, in the original CT report, only 14.7% (95% CI: 9.8%–20.9%) of all fractures were mentioned in the diagnostic summary, and 35.3% (95% CI: 28.1%–43.0%) were mentioned in the free-text narrative only.

Conclusion

Despite excellent educational programs, reporting rates of vFXs in CT scans have not improved in the past decade. The findings of this study suggest an urgent need for improved reporting protocols to ensure vFXs are clearly communicated, thus improving clinical decision-making and patient outcomes.

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P719

ASSESSMENT OF SKELETAL HEALTH AFTER IDENTIFICATION OF VERTEBRAL COMPRESSION FRACTURES BY A NATURAL LANGUAGE PROCESSING ALGORITHM

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Objective: This retrospective study aimed to assess the rates of subsequent action following a vertebral compression fracture (VCFx) by identifying the completion of dual-energy x-ray absorptiometry (DXA) scans as a proxy to further assessment and management of osteoporosis.
Methods: Data were extracted from the reports of computed tomography (CT) scans from a single academic medical center between December 16, 2021, to January 2, 2022. Studies included those of the chest, abdomen, and pelvis in individuals aged 50 or over. A Natural Language Processing (NLP) algorithm (Aidoc, Tel Aviv, Israel) was then applied to the reports of the CT scans to code scans either positive or negative for VCFx. In positive cases, whether or not a DXA scan was performed within the prior 12 months or the subsequent 12 months was then identified as a proxy to determine if further assessment and management of skeletal fragility had been initiated.
Results: There were 7,050 individuals and 12,156 CT scans eligible for assessment. Of those, the NLP algorithm identified VCFx in 293 individuals. 3% (8/293) of individuals did have a DXA scan performed in the preceding 12 months of the index CT scan. Of the 285 individuals who did not have a preceding DXA scan, only 7% (19/285) were identified to have undergone a DXA scan in the subsequent 12 months.
Additionally, 7% (20/293) of patients with serial imaging available during the 12 months following the index CT scan, exhibited progression of disease, demonstrated by the occurrence of a new fracture or worsening of an existing fracture.
Conclusion: This study reveals a critical gap in osteoporosis assessment and management, with 93% of patients in this cohort with a VCFx missing evidence of follow-up assessment of bone health. These findings emphasize the need to integrate secondary prevention pathways after identification of a VCFx to reduce future fracture risk. NLP algorithms offer a promising tool to identify at-risk patients and therefore offer a unique opportunity to further close the osteoporosis treatment gap.

P720

DEVELOPMENT OF AN ELECTRONIC MEDICAL RECORD BASED DASHBOARD TO FACILITATE POST-FRACTURE CARE

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Objective: To develop a real time centralized dashboard utilizing multiple sources of data from the electronic medical record (EMR) in order to facilitate and identify appropriate individuals for post-fracture care programs.

Material and Methods: Within a single academic health system, candidate items were identified to be incorporated into the dashboard and abstracted from the Epic Caboodle (Epic Systems Corporation, Verona, WI) database. These included 1: demographic data such as race/ethnicity and primary insurance coverage, 2: ICD10 codes related to fracture, 3: details relating to inpatient admissions and outpatient visits with fracture as the primary diagnosis, 4: data regarding secondary work up of osteoporosis and 5: information on prescriptions for FDA-approved therapies for fracture risk reduction. Once these individual pieces of data were identified, a centralized dashboard was created in Tableau (Salesforce, Inc., San Francisco, CA) to present this data in an actionable format.

Results: A dashboard which can be updated on a daily basis was created in Tableau (Figure 1) to identify individuals who meet criteria to be included in post-fracture care programs. The dashboard is able to be configured at a health system level by variables such as date of admission for fracture, type of fracture as well as race/ethnicity and insurance status. At an individual patient level, the dashboard can identify who has been referred to and seen by Endocrinology or Rheumatology for assessment and management of osteoporosis, including if therapy for fracture risk reduction has been initiated. It is additionally able to track metrics such as 12-month readmission and mortality post-index fracture (Figure 2).

Conclusions: A post-fracture care dashboard utilizing data within the EMR has been created which is able to identify and follow individuals post-fracture to ensure that further assessment and medical management of osteoporosis occurs. Additional work is underway to utilize this dashboard with the aim to reduce the osteoporosis treatment gap.

Figure 1: example of individual level data within the post-fracture care dashboard

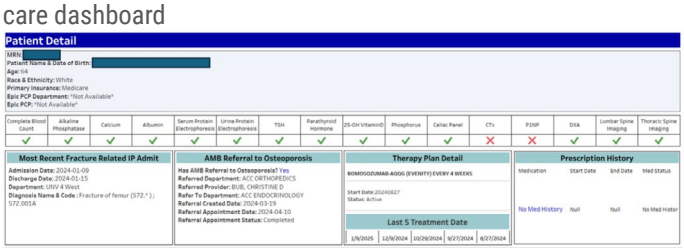
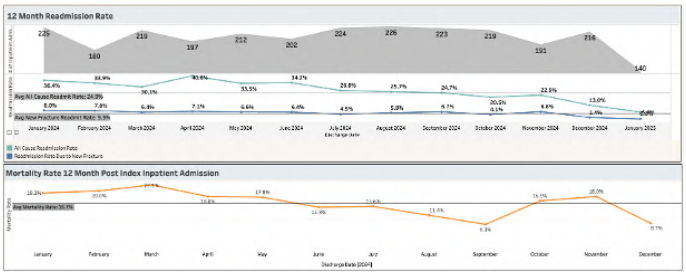


Figure 2: example of 12-month fracture, readmission and mortality trends within the post-fracture care dashboard



P721

IMPORTANT PREDICTORS OF INCIDENT HIP FRACTURE VARY BY BODY MASS INDEX (BMI)

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Objective: Hip BMD measures are less precise at very high levels of BMI. Our aim was to determine if the relative importance of BMD and other variables for hip fracture prediction vary by BMI.

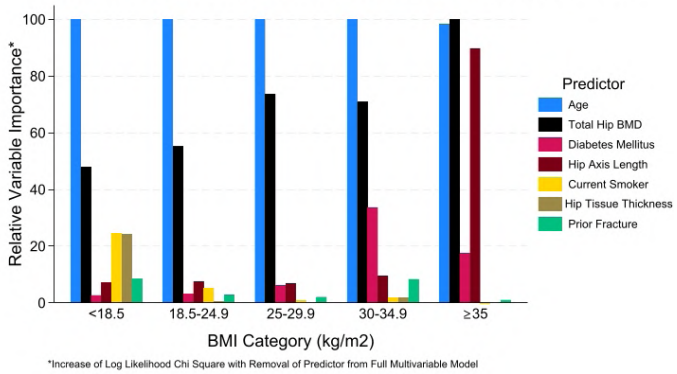
Material and Methods: 75,391 individuals (mean [SD] age 64.0 [10.8] years, 90.3% female) were followed for a mean (SD) 8.6 (5.3) years after baseline DXA for incident hip fracture ascertained through Manitoba linked health claims. Total hip BMD, hip axis length (HAL), and hip soft tissue thickness were ascertained on GE Lunar Prodigy (n=55790) or iDXA (n=19601) densitometers. Prior fracture, prior falls related hospitalizations, and diagnosis of diabetes mellitus were ascertained through linked health claims. Cox proportional hazards models were used to estimate the association of predictors with incident hip fracture stratified by BMI level (<18.5 kg/m^2, 18.5-24.9 kg/m^2, 25-29.9 kg/m^2, 30-34.9 kg/m^2, ≥35 kg/m^2). Relative variable importance for each predictor was separately estimated by the increase of model log-likelihood chi square value with removal of that predictor from the full multivariable model.

Results: Total hip BMD had a stronger association with incident hip fracture for those with BMI ≥ 35 kg/m^2 (HR 1.97 per SD decrease, 95% C.I. 1.49-2.59) than for those with BMI <18.5 kg/m^2 (HR 1.66 per SD decrease, 95% C.I. 1.29-2.13, BMD*BMI interaction p-value 0.033). Hip BMD was increasingly important as a predictor with increasing BMI (**Figure**). HAL was a particularly strong predictor of hip fracture if BMI ≥35 kg/m^2 (HR 2.27 per SD increase, 95% C.I. 1.66-3.11, HAL*BMI interaction p-value 0.031). Diabetes was more important as a predictor for those with BMI ≥ 30 kg/m^2, whereas smoking and hip soft tissue thickness were more important predictors if BMI <18.5 kg/m^2.

Conclusion: In those with high to very high BMI, hip BMD is as strong a predictor of hip fracture as for those with normal BMI, and HAL and diabetes are relatively more important hip fracture

predictors as well.

Figure: Relative Importance of Hip Fracture Predictors by BMI Level



*Increase of Log Likelihood Chi Square with Removal of Predictor from Full Multivariable Model

P722

ASSOCIATION OF NEIGHBORHOOD SOCIOECONOMIC DEPRIVATION INDEX WITH ABDOMINAL AORTIC CALCIFICATION: THE UK BIOBANK IMAGING STUDY

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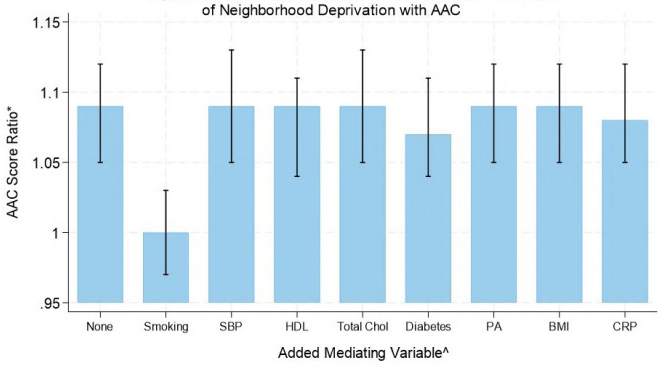
Objective: Residence in socioeconomically deprived neighborhoods (SDN) is associated with adverse health outcomes, and a constellation of neurohormonal/metabolic changes (allostatic load) that in turn causes premature tissue/organ aging and loss of physiologic resilience. We hypothesized that SDN is associated with abdominal aortic calcification (AAC), a marker of multisite atherosclerosis,assessed on bone density (DXA) lateral spine images (LSI).

Material and Methods: 35,493 UK Biobank enrollees with complete covariate data at baseline (mean [SD] age 54.9 [7.6] years, 49.3% female), who also had a DXA-LSI an average (SD) 9.7 (2.3) years later were included. AAC was scored using a validated algorithm developed by convolutional neural networks. Baseline Townsend Index was used to represent SDN and modeled as quintiles. We used exponential regression models to estimate the association of SDN with AAC score. Base model was adjusted for age, sex, and ethnicity. The attenuation of the association of SDN with AAC by potential mediators / confounders was then assessed by adding covariates singly and separately to the base model. Regression models were used to estimate the association of SDN with these potential mediators / confounders.

Results: In the base model, those in the poorest quintile had a 9% greater AAC score compared to those in the wealthiest quintile (**Figure**). Smoking was the sole potential mediator that attenuated this association. In an ordinal logistic model adjusted for age, sex, and ethnicity, SDN was associated with increase of smoking status (Odds Ratio for past vs never 1.69 [95% CI 1.58, 1.81]; current vs past 2.18 [95% C.I. 1.91, 2.49] highest vs lowest SDN quintile).

Conclusion: Residence in a poor SES neighborhood is associated with AAC, but its influence appears small and may be mediated by smoking status. These results are not generalizable to other societies that may have weaker or stronger gradients of socioeconomic neighborhood deprivation.

Figure: Effect of Potential Mediator Variables on Association of Neighborhood Deprivation with AAC



*Ratio of AAC Scores of Highest to Lowest Neighborhood Deprivation Quintile (light blue bars). Black capped lines are 95% confidence intervals

^Added covariate to base model covariates (age, sex, ethnicity). SBP: Systolic Blood Pressure. HDL: HDL Cholesterol. PA: Physical Activity. BMI: Body Mass Index. CRP: C-reactive protein

P723

ANALYSIS FOR COMPRESSION RATE PROGRESSION IN OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURE

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OBJECTIVE: To analyze whether there were any factors affecting the compression rate progression of osteoporotic vertebral compression fractures (OVCF) and also investigate the period when the compression rate progressed the most.

MATERIAL AND METHODS: Total 61 patients followed up more than 6 months were included in this study. The patient's age, gender, level of fracture, bone mineral density(BMD), body mass index(BMI), previous osteoporosis medication, initial compression rate, fracture location on vertebral body, and pelvic incidence were measured, and the correlation of the compression rate progression by more than 30% at the final follow-up was analyzed. Compression rates were measured at initial, 1 month, 2 months, 3 months, and final 6 months follow-up, then the progression of compression rate over time was analyzed, and the correlation with clinical results was also investigated. Statistical univariate analysis was performed for factors related to compression rate progression and multivariable Cox regression analysis was done. Compression rate progression according to time was analyzed

using a general linear model, and clinical outcomes were analyzed by paired t-test.
RESULTS: In univariate analysis, only when the initial compression rate was less than 30% was significantly high(p=0.001). In multivariable Cox regression analysis, it was analyzed as significant when the initial compression rate was less than 30%(p=0.015, Hazard ratio=3.103, 95% Confidence Interval 1.249-7.710). Also, the compression rate progressed over time, the most at 1 month of follow-up(p=0.0006). At the final follow-up, both VAS for back pain(p=0.034) and ODI(p=0.025) were significantly higher in the compression rate progression group.
CONCLUSIONS: An initial compression rate of less than 30% was associated with a higher correlation of compression rate progression, particularly within the first month after injury. Compression rate progression was correlated with poorer clinical outcomes in terms of pain and quality of life.

P724

TRENDS IN HIP FRACTURE INCIDENCE IN ENGLAND BEFORE, DURING, AND AFTER THE COVID-19 PANDEMIC (2014-2023)

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Objective
To investigate recent trends in hip fracture incidence in England before, during, and after the COVID-19 pandemic.
Methods
An epidemiological population-based study was conducted of all first-time emergency hip fracture hospital admissions unrelated to high-energy trauma in adults aged ≥ 60 years using English national secondary care data with linked national death records from January 2014 to December 2023. Temporal trends in age-standardized incidence rates were investigated by sex using national mid-year population estimates. Joinpoint regression models with permutation tests were used to calculate monthly percent changes with 95% confidence intervals (MPCs, 95% CIs).
Results
From 2014 to 2023, there were 429,499 hip fracture admissions in women, and 187,566 in men. Age-standardised incidence rates steadily declined from 2014 to 2020, from a mean monthly rate of 20.1 to 17.6 cases per 100,000 men, and from 33.2 to 27.7 cases per 100,000 women (MPC in men: -0.17%, 95% CI: -0.23 to -0.11; MPC in women: -0.23%, 95% CI: -0.28 to -0.18). The direction of the trend changed in February 2021 in men and women, after which rates remained relatively flat (MPC for men: 0.14, 95% CI: -0.07 to 0.35; MPC for women: 0.13%, 95% CI: -0.05 to 0.31; p for slope change < 0.01 for both). By 2023, mean monthly incidence rates were 17.7 cases per 100,000 men and 28.2 cases per 100,000 women. The incidence of hip fracture was higher in women than in men (IRR 1.62, 95% CI: 1.61 to 1.64), but temporal trends were broadly consistent in both sexes.
Conclusion
This study highlights a downward trend in hip fracture incidence rates from January 2014 to February 2021 in England, followed by a sudden plateau from February 2021 onwards in men and women. Further investigation is needed to understand the cause of this change. Continued surveillance is needed to inform planning of emergency hip fracture care services and to measure the effectiveness of prevention strategies, particularly in the context of ongoing disruption and reorganisation of healthcare services in the UK.
Figures

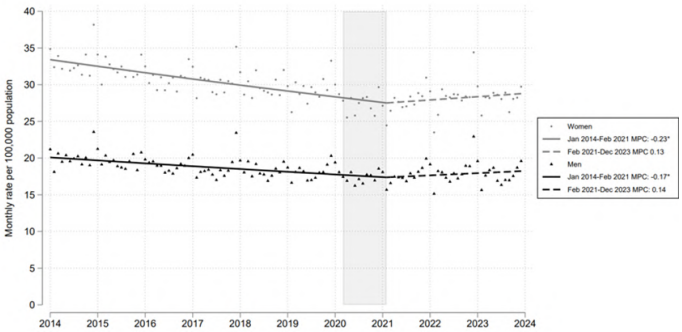

Figure 1: Age-standardised hip fracture incidence rates in England by sex, January 2014 to December 2023. *Indicates significance (p<0.05). MPC: monthly percentage change. The shaded area indicates a period of COVID-19-related public health restrictions.

Disclosures
None.

P725

EFFECT OF 3D PRINTING-ASSISTED MIPPO IN THE TREATMENT OF CLAVICLE FRACTURE

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Objective: To investigate the effect of 3D printing-assisted minimally invasive percutaneous plate osteosynthesis (MIPPO) in the treatment of clavicular fracture. ***Methods:*** Twenty-eight cases of clavicular fractures were randomly divided into two groups: 3D printing-assisted MIPPO group and MIPPO group, fourteen cases in each group. In the 3D printing-assisted MIPPO group, CT scan the healthy clavicle side before the operation to provide inverted image in the software in order to build the 3D printed physical model which is helpful in selecting the steel plate of appropriate length, whose local angle can also be adjusted and preset, whereas the MIPPO group only made a surgical plan based on imaging data. The incision length, bone fracture healing time, operation time, bleeding volume, fluoroscopy times, incidence of complications, Constant score, DASH score and Neer score were compared between two groups. ***Results*** Between 3D printing-assisted MIPPO group and MIPPO group, there was no significant difference in aspects of incision length [(7.71±1.32) cm VS. (8.04±1.41) cm], bone healing time [(2.9±0.2) months VS. (3.0±0.3) months], Constant scores (97.21±1.26) *vs.* (94.35±2.31), DASH scores (2.71±0.16) *vs.* (2.93±0.32) and Neer scores (93.5±3.1) *vs.* (91.2±2.7). There were significant differences in aspects of bleeding volume [(45.3±4.2) mL *vs.* (72.4±1.9) mL], operation time

[(40.2±6.3) min *vs.* (53.2±4.1) min], fluoroscopy times (3.4±1.2) *vs.* (6.2±1.9), rate of superficial infection around the incision (0% vs.7.146%) and incidence of internal implants protrusion (7.14% VS. 28.6%), $P < 0.05$. ***Conclusion*** 3D printing-assisted MIPPO has great significance in the treatment of clavicular fracture. It is helpful the doctor to select the appropriate length of anatomic plate before operation and to pre-bend and adjust it. It is also helpful the surgeon to clearly know the expected operation reduction and understand the expected effect. So as to shorten the operation time, reduce the amount of bleeding and reduce the number of fluoroscopy. It is worthy of clinical application.

P726

PATOS (PATIENT EDUCATION IN OSTEOPOROSIS): FEASIBILITY AND EFFECTIVENESS OF A DIGITAL PATIENT EDUCATION PROGRAM IN IMPROVING SELF-CARE IN PATIENTS WITH OSTEOPOROSIS - A PILOT STUDY

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Objective: To assess the feasibility and effectiveness of a digital patient education program in improving self-care enablement, illness perception, perceived osteoporosis knowledge and self-care maintenance among patients with osteoporosis.
Material and methods: Thirty patients with osteoporosis participated in a digital patient education program. The program included eight modules covering key topics on osteoporosis knowledge and self-care maintenance (approximately 5 hours of e-learning) that participants completed at their own pace. Questionnaires were administered before and after 5 weeks. Outcome measures included the Patient Enablement Instrument (PEI), the Brief Illness Perception Questionnaire (BIPQ), and patient-reported ratings of perceived osteoporosis knowledge and self-care maintenance such as osteoporosis medication adherence, diet, exercise habits, fall prevention, and ergonomics. Results were analyzed using descriptive statistics and paired sample tests to evaluate changes in outcomes.
Results: All participants (90% women, mean age 70 ± 6.4, 27% with previous vertebral fractures) completed the program and expressed a high willingness to recommend it to others (83% "strongly recommend"). Content quality (mean score 4.3 ±0.6), and perceived benefits (mean score 4.1 ±1.1) of the program were rated highly on a 6-grade scale with a maximum score of 5. The mean PEI score (0-12) was 5.5 ±3.7, with 90% of the participants reporting improved understanding of the disease, and 77% reporting enhanced coping ability. BIPQ scores and perceived osteoporosis knowledge showed significant improvements (p< 0.001). Self-care maintenance also significantly improved (p<0.01) including regular practice of balance and weight-bearing exercises, and ergonomic adaptation in daily activities.
Conclusions: Participation in a digital patient education program improved self-care enablement, illness perception, perceived osteoporosis knowledge and self-care maintenance among patients with osteoporosis. Digital patient education programs may offer substantial benefits for patients with osteoporosis. Future research should explore the long-term effects of digital and traditional patient education programs on self-care maintenance and health-related quality of life in patients with osteoporosis. Additionally, combining patient education with supervised exercise interventions may enhance outcomes for some patients.

P727

SEX DIFFERENCES IN THE SUBJECTIVE PAIN PERCEPTION, FALL RISK AND FUNCTIONAL STATUS OF PATIENTS WITH KNEE OSTEOARTHRITIS

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Objective(s) To examine whether the knee osteoarthritis (OA) patients' subjective pain perception, fall risk, and functional status of the lower extremities are affected by their sex.
Material and Methods: This prospective cross-sectional study involved 50 individuals treated at the Special Hospital for Rheumatic Diseases in Novi Sad, Serbia, in whom knee OA was diagnosed at least 3 years prior (VAS ≥ 5). Patients of both sexes were included and their age ranged from 60 to 75 years. The exclusion criteria were: metabolic disorders of the joints, inflammatory rheumatic disease, endoprothesis of the lower extremities, and history of lower-extremity fractures. Following the institutional Ethics Committee approval, all eligible patients signed an informed consent form. The VAS scale was administered to measure subjective pain perception, fall risk was assessed via the Morse Fall Scale (MFS), and functional status was evaluated using the Serbian version of the Lower Extremity Functional Scale (Srb-LEFS). All analyses were conducted using the SPSS ver. 24. As the aim was to conduct gender comparisons, t test for large independent samples was conducted.
Results: While the full sample (M = 69.06±4.98 years, 92% female) had a VAS score of 7.18±1.45, it was lower for men (6.75±2.22) relative to women (7.22±1.40), but the difference was not statistically significant (p=0.543). Men also had a significantly lower MFS score than women (6.25±12.50 vs. 33.48±20.08, p=0.011). Moreover, men had greater functional status of the lower ex-

tremities, as measured by the Srb-LEFS scale (47.00±17.22 vs. 35.83±13.40). However, this difference was not statistically significant (p=0.123).
Conclusion: As the risk of falling is statistically higher in women with knee osteoarthritis relative to men, this risk factor needs to be considered when developing personalized prevention strategies and designing sex-specific prediction tools for identifying high-risk patient profiles.

P728

THE INFLUENCE OF OCCUPATIONAL PHYSICAL DEMANDS AND TASK PERFORMANCE MODE ON THE FALL RISK AND THE FUNCTIONAL STATUS OF PATIENTS WITH KNEE OSTEOARTHRITIS

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Objective(s) To examine whether in patients with knee osteoarthritis (OA), the fall risk and the functional status differ in relation to the physical and postural demands of occupational tasks.
Material and Methods: This prospective cross-sectional study included 50 patients of both sexes aged 60–75 years that have suffered from knee OA for at least 3 years, with VAS ≥ 5 pain score, treated at the Special Hospital for Rheumatic Diseases in Novi Sad, Serbia. The research was approved by the institutional Ethics Committee and all patients signed an informed consent form before completing a questionnaire comprising sociodemographic data, occupational task performance methods, Morse Fall Scale (MFS) for fall risk assessment, and cross-cultural validation of the Serbian version of the Lower Extremity Functional Scale (Srb-LEFS). Patients with inflammatory rheumatic disease, metabolic disorders of the joints, lower-extremity endoprosthesis, and prior lower-extremity fractures were excluded. Statistical package SPSS ver. 24 was used for all analyses.
Results: The average MFS and LEFS scores for the sample (M = 69.06 ± 4.98 years, 92% women) were 31.30 (SD = 20.87) and 36.72 (SD = 13.87), respectively. Fall risk was lower among individuals that mostly stand at work without bending down/lifting heavy loads (24.38; SD = 20.43) compared to those whose tasks involve bending/lifting loads (32.29; SD = 20.59). The former group had a higher average LEFS score (39.50; SD = 5.53) relative to the latter (35.58; SD = 14.06). However, neither difference was statistically significant (p = 0.597; p = 0.790).
Conclusion: Although the difference in work performance is not statistically significant, the fall risk is lower and the functional status is better in patients with knee OA whose occupation involves standing but does not require bending/lifting. Thus, strategies for mitigating the risk factors predisposing them to more pronounced knee OA are necessary.

P729

DISEASE ACTIVITY AND QUALITY OF LIFE OF PATIENTS WITH RHEUMATOID ARTHRITIS RECEIVING BIOLOGICAL THERAPY

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Objective: To examine the relationship between disease activity and quality of life in patients with rheumatoid arthritis (RA) treated with biological drugs.
Material and methods: With the approval of the Ethics Committee of the Special Hospital for Rheumatic Diseases in Novi Sad, Serbia (14/01-1/1-25), a retrospective analysis of data spanning a 5-decade period pertaining to 39 RA patients that had received biological therapy was performed. General sociodemographic data, illness duration, biological drug (anti-TNF inhibitors) treatment length, Disease Activity Score (DAS28), and the Health Assessment Questionnaire (HAQ) index were analyzed using the SPSS ver. 24 commercial software.
Results: The average HAQ and DAS28 value for the sample (comprising 71.8% women) was 0.85 ± 0.51 and 3.30 ± 1.00, respectively. In terms of disease activity, 33.3% of respondents were in remission, 30.8% had low disease activity, 35.9% had moderate disease activity, and none had high disease activity. A statistically significant negative correlation between disease duration and DAS28 score (p = 0.043) and well as biological treatment length (p = 0.029) was noted. DAS28 = 4.35 ± 0.29 was obtained for patients with RA duration below 5 years, while those who have been ill for 6–10 years scored 2.80 ± 0.91. Similarly, DAS28 scores of 2.43 ± 0.73 and 3.50 ± 0.96 were attained by those receiving biological drugs for more than 5 years and up to 12 months, respectively. On the other hand, the correlation between disease activity and HAQ index was statistically significant and positive (r = 0.618, p < 0.01), suggesting that quality of life declines with greater disease activity.
Conclusion: In RA patients, disease activity declines with the biological therapy duration. However, higher disease activity is associated with worse quality of life.

P730

THE INFLUENCE OF MORNING STIFFNESS, PAIN, AND FATIGUE ON THE KEY GRIP STRENGTH IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Objective: To examine the influence of morning stiffness, pain, and fatigue on the key grip strength in patients with rheumatoid arthritis (RA).

Material and methods: The sample for this prospective cross-sectional study comprised 56 RA patients of both sexes treated at the Special Hospital for Rheumatic Diseases in Novi Sad, Serbia. After signing the informed consent form, the participants rated their hand pain intensity on the 0–10 VAS Visual Pain Scale and fatigue intensity on a 0–10 scale. The precision key grip strength (kg) was estimated using the Baseline-Mechanical Pinch Gauge dynamometer. The association between the VAS and fatigue scores and the key grip strength in both hands was tested through Spearman's correlation coefficient, while Using the Kruskal Wallis test was conducted to check whether there is a statistically significant difference between the morning stiffness duration and the key grip strength in both hands.

Results: The median VAS and fatigue scores for the sample (average age 63, 92.9% women, all right-handed) were Me=7.00 (IQR=2.0) and Me=7.00 (IQR=3.0), respectively. There was no statistically significant correlation between the VAS score and the key grip strength in the right (rho=-0.088, p>0.05) or the left hand (rho=-0.140, p>0.05). Similarly, no statistically significant correlation between the fatigue score and the key grip strength in either hand was established (right: rho=-0.259, p>0.05; left: rho=-0.163, p>0.05).On the other hand, morning stiffness duration was in a statistically significant relationship with the key grip strength of the right hand (p=0.008), as well as the left hand (p=0.001). Patients in whom morning stiffness lasts up to 30 minutes had the strongest key grip (right hand: Me=7.78, IQR=6.13; left hand: Me=8.75, IQR=5.63). Those with the longest morning stiffness (>60 min) had the weakest right-hand grip (Me=4.00, IQR=6.10; Me=3.16, IQR=5.83).

Conclusion: RA patients who have morning stiffness of longer duration have a weaker key grip in both hands, while pain and fatigue do not affect the key grip strength.

P731

REHABILITATION PROCESS AFTER TIBIA AND FIBULA FRACTURES IN ADOLESCENTS: A CASE REPORT

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Fractures of both, tibia and fibula, in adolescents are common (5% of all fractures) and generally have good outcomes due to the high healing potential and bone remodeling ability in pediatric patients.

Case Report: A 16-year-old boy was injured in a traffic accident and diagnosed with distal tibia and fibula fractures. Five days after the injury, he underwent surgery (orthopedic repositioning and osteosynthesis). He was referred for outpatient rehabilitation, shortly after surgery, at the Clinic for Physical Medicine and Rehabilitation, Novi Sad, Serbia. Informed consent was obtained from the patient and his parents, with approval from the Ethics Committee (decision no: 3987-3/2024). Range of motion (ROM) was measured using a goniometer, and muscle strength was assessed weekly with the Manual Muscle Test (MMT). At the initial assessment, the patient used crutches and did not bear weight on the right leg. Swelling (1 cm) was present in the lower leg and foot, and thigh muscle atrophy (1 cm) was noted. ROM in the knee was normal, but only initial dorsiflexion and plantarflexion were possible in the ankle due to pain. The 6-week rehabilitation program included physical modalities (interferential therapy, paraffin therapy) and kinesiotherapy. Treatment goals included reducing pain and swelling, restoring ankle mobility, improving muscle strength, and reintegrating the patient into daily and sports activities. Initially, the patient was non-weight-bearing and used crutches. By the third week, partial weight-bearing (up to 30%) was allowed, with individual kinesiotherapy tailored to the patient's progress. At the end of 6 weeks, the patient was advised to return to daily activities and gradually resume sports, under guidance from a sports physician.

Conclusion: An individually tailored rehabilitation process after tibia and fibula fractures in adolescents leads to complete functional recovery and return to daily activities.

P733

INFLUENCE OF TEGOPRAZAN AND PROTON PUMP INHIBITORS ON BONE QUALITY AND FRACTURE RISK IN RHEUMATOID ARTHRITIS PATIENTS: INSIGHTS FROM BMD AND TBS ANALYSES

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Background: Glucocorticoid-induced osteoporosis (GIO) poses a significant threat to rheumatoid arthritis (RA) patients undergoing long-term glucocorticoid therapy. Bone mineral density (BMD) and trabecular bone score (TBS) are essential tools for assessing bone quality and fracture risk. The effect of acid-suppressive therapies, including proton pump inhibitors (PPIs) and tegoprazan, on these bone parameters remains underexplored.
Objective: To evaluate the impact of tegoprazan and PPIs on bone quality and fracture risk in RA patients with GIO, with a focus on BMD and TBS changes.
Methods: This retrospective study involved RA patients treated with glucocorticoids and either tegoprazan or PPIs for at least three months. BMD and TBS were assessed using dual-energy X-ray absorptiometry (DXA), and osteoporotic fractures were confirmed via spinal radiographs. Multiple linear regression was conducted to analyze factors associated with annualized BMD percent change, and logistic regression was used to identify fracture risk factors.
Results: Among the 184 patients (92 in the tegoprazan group, 92 in the PPI group), baseline lumbar spine BMD was significantly higher in the tegoprazan group ($p<0.001$), but no significant differences were observed in TBS or femoral neck BMD. Multiple linear regression analysis indicated that tegoprazan had no significant effect on BMD changes ($\beta = -0.111$, $p = 0.505$ for lumbar spine; $\beta = -0.083$, $p = 0.556$ for femoral neck). However, the cumulative glucocorticoid dose during follow-up was a significant predictor of femoral neck BMD change ($\beta = -0.296$, $p = 0.046$). Logistic regression analysis revealed that cumulative glucocorticoid dose was also a significant risk factor for new-onset fractures (OR = 1.003, $p = 0.034$), but neither tegoprazan nor TBS changes showed significant associations with fracture risk in multivariate analysis.
Conclusions: This study highlights that tegoprazan does not significantly impact BMD or fracture risk compared to PPIs in RA patients with GIO. Cumulative glucocorticoid exposure remains a critical factor in both BMD reduction and fracture risk. Further prospective studies are needed to explore the long-term effects of tegoprazan on bone health.

P734

RECURRENT FRACTURES IN A YOUNG WOMAN: UNMASKING CUSHING'S DISEASE AND HYPERPROLACTINEMIA SECONDARY TO A FUNCTIONAL PITUITARY ADENOMA

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Objective: To investigate the cause of recurrent bilateral metatarsal bones fractures and severe low bone mass in a 41-year-old Emirati woman with history of bariatric surgery, a one-year history of breast congestion and galactorrhea, and a 3-month of amenorrhea, hirsutism, and striae.
Materials and Methods: This patient was initially referred from the Orthopedic clinic to the rheumatology clinic for evaluation of osteoporosis. Comprehensive biochemical and hormonal profiling (vitamin D, PTH, prolactin, ACTH, cortisol, IGF-1), BMD assessment, FRAX evaluation, pituitary MRI, and histopathology were conducted to determine the underlying cause of osteoporosis.
Lab results showed severe vitamin D deficiency, hyperparathyroidism, and hyperprolactinemia, elevated ACTH and cortisol, and low IGF-1, consistent with pituitary dysfunction. BMD revealed levels severely below the age-expected range: L1-4 (0.947 g/cm², Z-score: -3.2), right femoral neck (0.777 g/cm², Z-score: -2.2), and left femoral neck (0.832 g/cm², Z-score: -1.8). FRAX indicated a 1.4% 10-year risk of major osteoporotic fracture and 0.3% for hip fracture. MRI and histopathology confirmed a corticotroph pituitary adenoma with Crooke's hyaline changes, consistent with Cushing's disease and hyperprolactinemia due to stalk compression. Symptoms resolved after transsphenoidal hypophysectomy and a short-term hydrocortisone replacement.
Results: Literature review revealed that Cushing's disease as a rare cause of secondary osteoporosis, with hypercortisolism increasing fracture risk. Hyperprolactinemia exacerbates bone loss via hypogonadism. Early diagnosis and surgical intervention improve outcomes.
Conclusion: Endocrine disorders like Cushing's disease and hyperprolactinemia should be considered in young patients with recurrent fractures. Early diagnosis and multidisciplinary management are crucial to prevent complications.
Reference:
Mazziotti et al. Pituitary Diseases and Bone. Endocr Rev. 2018 Aug 1;39(4):440-488. doi: 10.1210/er.2018-00005. PMID: 29684108.
Disclosure and funding: None

P735

A MULTIDISCIPLINARY CHALLENGE: RECURRENT FRACTURES, CUSHING'S SYNDROME, AND BREAST CANCER IN A 45-YEAR-OLD WOMAN

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Objective: To investigate recurrent fractures and osteoporosis in a 45-year-old Pakistani woman referred for assessment of recurrent non-traumatic fractures.
Materials and Methods: The patient had diabetes mellitus, hypertension, anxiety, and a chronic thyroid cyst. She sustained six fractures: left and right metatarsal fractures (2020–2021) and left pubic ramus fractures (2020). Clinical findings included central obesity, oligomenorrhea, hand osteoarthritis, and telangiectasias. Normal tests included total ALP, corrected calcium, phosphorus, magnesium, prolactin and 24-hour urine catecholamines. Elevated morning serum cortisol, low ACTH, and unsuppressed cortisol on dexamethasone testing suggested Cushing's syndrome.
BMD was within the expected range for her age: L1-4 (1.078 g/cm², Z-score: -0.9), right femoral neck (0.944 g/cm², Z-score: -0.9), and left femoral neck (0.882 g/cm², Z-score: -0.9). FRAX indicated a 2.3% 10-year risk of major osteoporotic fracture and 0.3% for hip fracture.
SPECT-CT showed increased uptake in feet, ankles, wrists, and also in the pubic fractures site. CT revealed a left adrenal lesion suggestive of adenoma. She underwent left adrenalectomy and was started on hydrocortisone. Pathology suggested adrenocortical adenoma. After 2 years, she was diagnosed with metastatic breast cancer and treated with chemotherapy and denosumab.
Results: Literature review highlights that endogenous Cushing's Syndrome, often due to adrenal adenomas, is a significant cause of secondary osteoporosis and recurrent fractures. Hypercortisolism increases bone resorption and reduces bone formation, leading to fragility fractures. Early surgical intervention (adrenalectomy) improved hypercortisolism, but the emergence of metastatic disease necessitated integrated oncological management.
Conclusion: This case illustrates the imperative to evaluate for endocrine disorders, particularly Cushing's syndrome, in patients with recurrent fractures, even when BMD and FRAX scores appear reassuring. Multidisciplinary management is essential to address osteoporosis and associated comorbidities.
Disclosure and funding: None

P736

THE FIRST COMPARISON OF HIP FRACTURE INCIDENCE ACROSS 4 COUNTRIES IN AFRICA

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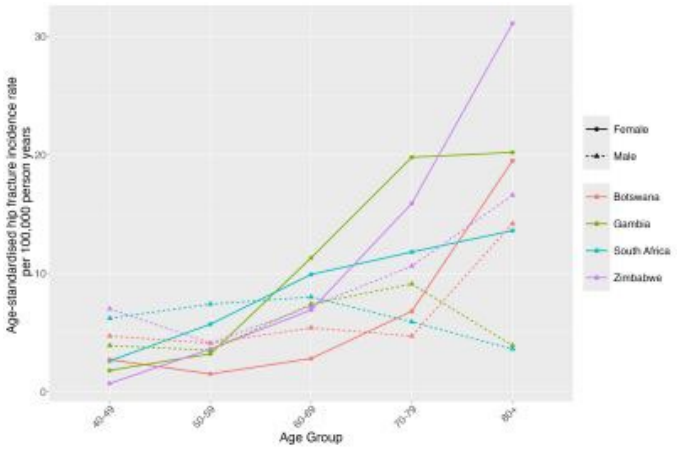
Objectives: To determine age and sex specific hip fracture incidence rates in adults age ≥40 years in The Gambia, West Africa and compare with those from other African countries.
Methods: All hip fracture cases in adults aged ≥40 years, presenting to a hospital or traditional bone setter (TBS) in the study area over 2-years, were identified. Age- and sex- specific hip fracture incidence per 100,000 person-years were estimated using the 2024 Gambian Population census. Incidence estimates were compared between The Gambia, Zimbabwe[1], South Africa[2] and Botswana[3]. Future hip fracture numbers were estimated to 2054 using UN population projections.
Results: Over 2-years, 238 (67% female) patients, mean(SD) age 71.3(12.5) years, presented to hospital (197[82.8%]) or TBS (37[15.5%]). Most reported fragility fractures (217[91.2%]). Presentation >2 weeks after injury was common (70[29.4%]). Incidence rates in The Gambia were 28.0 and 56.2/100,000 person-years for men and women respectively. Hip fractures numbers are predicted to nearly quadruple, from 175 in 2024, to 656 in 2054.
Age-standardised hip fracture incidence rates were broadly comparable between The Gambia, Zimbabwe, Botswana, and the Black South African population (Figure-1). All countries see higher incidence in men than women until age >50 years. The highest incidence rates in women age 60-74 years were in The Gambia, and in women age >75 years in Zimbabwe.
Conclusions: These are the first hip fracture incidence data from West Africa. Fragility fractures in Gambian adults were common, indicative of age-associated osteoporosis. Across the 4 countries, hip fracture cases are predicted to at least double over coming decades; in The Gambia they will quadruple. Healthcare systems now need to pivot to provide fracture services for ageing populations.
References: [1]Wilson BMJ Global Health 2025; [2]Dela Bone 2020; [3]Kebaetse Arch Osteo 2021



P738

INVESTIGATION OF THE CLINICAL RESPONSE OF ZOLEDRONIC ACID INJECTION AFTER 3- AND 5-YEARS TREATMENT COURSE IN POSTMENOPAUSAL OSTEOPOROSIS- A RETROSPECTIVE STUDY

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Background: Osteoporosis, characterized by bone fragility and increased fracture risk, is a global health concern. It affects millions of individuals with hip fractures, and the incidence is projected to rise substantially, especially in post-menopause women. The association between the duration of bisphosphonate therapy and the incidence of atypical fracture is still largely unknown, especially in long-term bisphosphonate therapy. Based on the above rationale, the present study aimed to assess and evaluate the long-term impact of zoledronic acid (ZA) treatment on bone mineral density (BMD) and fracture risk in Omani postmenopausal women after 3 & 5 years.

Objectives: To confirm the efficacy of ZA in maintaining BMD and reducing fracture risk over a longer duration than the standard 3-5 years treatment period among Omani women and to assess the safety profile of ZA.

Methodology: This is a retrospective observational study of the clinical response to ZA injection treatment at a tertiary care Trauma and Orthopaedic Centre in the Sultanate of Oman. Data was analyzed using SPSS-26 software. Continuous variables were described as mean, standard deviation (SD), median, and interquartile range (IQR). The Wilcoxon Signed Rank test with median and IQR was used for outcome variables showing non-normal distribution. Factors affecting the change in BMD outcome were assessed using independent samples (Kruskal-Walli's test). The significance level was considered at a p-value less than 0.05.

Results: A significant change in BMD at both hip and spine was observed, highlighting the effectiveness of the ZA treatment over a 2-year period. The BMD-hip increased from 0.578±0.099 g/cm2 at baseline to 0.596±0.102 g/cm2 after 2 years of treatment ($p < 0.001$) and BMD-spine, which increased significantly ($p < 0.001$) from a median of 0.619 to 0.699 g/cm2.

Conclusion: This study demonstrates the efficacy and safety of ZA in treating postmenopausal osteoporosis over a 3- and 5-year period. The results provide compelling evidence that ZA effectively reduces fracture risk and improves bone mineral density in this patient population. This study provides robust evidence supporting the use of ZA as an effective and safe treatment for postmenopausal osteoporosis.

Keywords:
BMD, Fragility fracture, Postmenopausal Osteoporosis, Zoledronic acid, Bisphosphonate.

P739

FACTORS AFFECTING MORTALITY AND QUALITY OF LIFE 1 YEAR AFTER SURGERY OF FRAGILITY HIP FRACTURES IN GREECE DURING THE ECONOMIC CRISIS

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Objective: Hip fractures are associated with a lower quality of the patient's life, increased morbidity and mortality. The primary aim of this study is to identify risk factors of mortality at twelve months after surgery for hip fracture and furthermore include the evaluation of functional outcomes and quality of life at the same period.

Material and Methods: Prospectively collected data from 597 patients with hip fractures that were treated in the tertiary hospital, and another 147 patients that were treated in a secondary hospital were available. The perioperative data were collected from medical charts and interviews. Functional Assessment Measure score, Short Form-12 and mortality were recorded at 12 months. Patients and surgery variables identified that were associated with increased mortality. Included all patients above 65 years of age, that were admitted to hospital with a fragility or geriatric hip fracture. Pathological and high energy fractures were excluded. All surgeries were performed from or under the supervision of fourteen trauma surgeons.

Results: In-hospital mortality was 2.4%. Mortality for the whole cohort was 19.4% at one year. In the tertiary hospital mortality was 18.3%, while in the secondary it was 23.0%. Functional outcome at one year was similar to preoperative status, even though their level of physical function dropped after the hip surgery and slowly recovered. From the variables tested BMI < 25, age > 80, CCI > 6, time to surgery > 48 hours, ASA ≥ 3, use of anti-coagulants and male sex was associated with increased mortality.

Conclusion: The study cannot affect or modify the treatment management of hip fractures which is based on early surgery. Nonetheless, it could possibly detect high risk patients so appropriate management is initiated early.

Keywords: hip fractures; mortality; functional outcome; time to surgery

P740

BERTOLOTTI SYNDROME – HIDDEN CAUSE OF LOWER BACK PAIN

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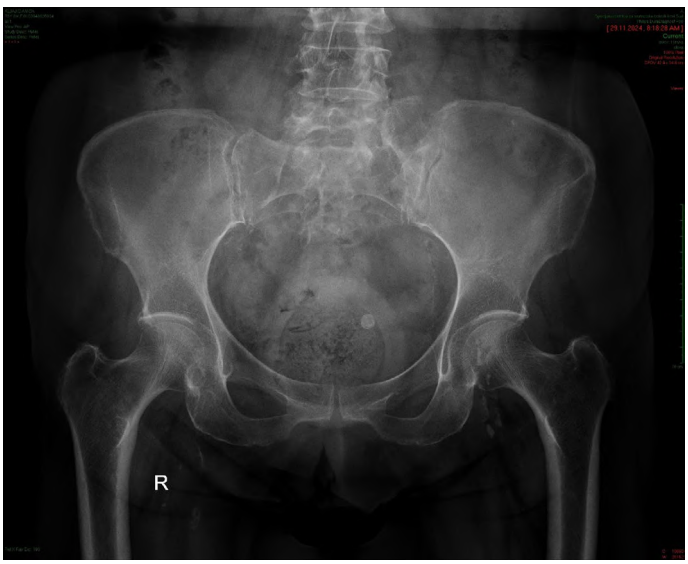
Objectives: Differential radiological evaluation in a female patient with lower back pain syndrome (LBPS) with a focus on Bertolotti syndrome (BS). BS is characterized by the presence of a lumbosacral transitional vertebra, in the form of an enlarged transverse process of the fifth lumbar vertebra (greater than 19 mm), with a tendency toward pseudoarticulation or fusion with the sacrum, with or without compromise of the nerve roots. Based on the presence of pseudoarthrosis, BS is classified into four groups according to the Castellvi classification, with two subgroups: A (unilateral) and B (bilateral).
Material and Methods: A 76-year-old female patient presents with chronic pain in the hips and lower back. Radiographs of the pelvis in the AP lying position were performed on a Philips DuraDiagnostic F30 machine. Ethical approval (No. 14/01-2/1-25, 13.01.2025.) was obtained from the ethics committee of the Special Hospital for Rheumatic Diseases in Novi Sad, Serbia, and the patient signed an informed consent form.
Results: An oval bony formation, approximately 30 mm in size, is positioned para-vertebral and suprasacral on the left side of the fifth lumbar vertebral body. This formation could belong to the transverse process of the fifth lumbar vertebra or an extension of the lateral side of the first sacral vertebra. The above-described findings may indicate Bertolotti syndrome type IIIa, according to the Castellvi classification, based on the absence of pseudoarthrosis.



Conclusion: The pelvic X-ray raises suspicion of Bertolotti syndrome. The patient has been referred for a CT scan of the lumbar spine to confirm the definitive diagnosis.

P741

GLUCOCORTICOID - INDUCED OSTEOPOROSIS IN A PATIENT WITH SJÖGREN'S SYNDROME – CASE REPORT

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Objective: Case report of a patient suffering from Sjögren's syndrome (SS) with iatrogenic osteoporosis and multiple fractures caused by glucocorticoids (GCs).
Material and Methods: A 62-year-old female patient was hospitalized at the Special Hospital for Rheumatic Diseases in Novi Sad due to osteoporosis and multiple fractures. Clinical, radiological (DXA), basic laboratory and bone metabolism marker tests were performed. Ethical approval (No. 14/02-1/1-25, 27.01.2025.) was obtained from the ethics committee of the Special Hospital for Rheumatic Diseases in Novi Sad, Serbia, and the patient signed an informed consent form.
Results: The first symptoms, including dryness of the eyes and mouth, difficulty swallowing, joint pain, and swelling of the neck lymph nodes, appeared in 2003. This coincided with laboratory confirmation of leukopenia and anemia, and the diagnosis of primary SS was made. Glucocorticoid therapy was initiated. In 2010, the patient's symptoms worsened, presenting as acute polyarthritis with morning stiffness. Antimalarials and GCs were introduced into the treatment regimen. Due to inadequate clinical response, methotrexate was added to the therapy but was soon discontinued due to leukopenia and anemia. Treatment continued with antimalarials and GCs. In 2019, an attempt to discontinue GC therapy led to an exacerbation of symptoms. Due to anemia, a pathohistological examination of a bone marrow biopsy was performed, which revealed hypoplastic changes and osteoporosis. In late 2013, after a fall, the patient sustained pathological fractures of Th6 and Th7 vertebra. In 2019, a fracture occurred at Th12 vertebra, followed by a fracture of the fourth finger of the right hand in 2020, and a fracture of L3 vertebra in 2024. Recent laboratory results for bone markers show moderate activity of bone structure breakdown, while the DXA scan suggests osteopenia. The ESSDAI score is 20 and the ESSPRI score is 8.33. Despite prolonged use of antimalarials and GCs, adequate disease control has not been achieved. In November 2024, sulfasalazine was replaced with azathioprine.
Conclusion: Although an attempt was made to de-escalate GC therapy due to osteoporosis, there are currently no effective therapeutic options. The patient will be reevaluated for more modern treatments for osteoporosis and SS.

P742

OSTEAOATHRITIS IN STROKE PATIENTS - THE IMPACT ON REHABILITATION TREATMENT AND HEALTH-RELATED QUALITY OF LIFE

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Objective: Osteoarthritis has been identified as a potential risk factor for stroke, as well as potential hinderance for stroke rehabilitation. The aim of this study was to determine the prevalence of osteoarthritis among stroke patients and compare health-related quality of life (HRQoL) and rehabilitation outcome between patients with and without osteoarthritis.
Material and Methods: This research was designed as a prospective cross-sectional study. A total of 150 stroke patients were consecutively recruited at the Medical Rehabilitation Clinic, Clinical Center of Vojvodina, Serbia. The presence of osteoarthritis of the hip or knee was determined at the beginning of the rehabilitation treatment using clinical evaluation and radiographic findings. At the end of the treatment, health-related quality of life (HRQoL) was determined by means of the Medical Outcomes Study 36-item Short Form (SF-36). Functional status was evaluated using Barthel index (BI). Multiple regression analysis was performed to determine the factors affecting the HRQoL of the stroke group.
Results: The overall prevalence of osteoarthritis in stroke patients was 25.56%. A significantly higher prevalence was registered in female patients (38.26%) compared to male patients (17.67%). The mean role physical score of the group of patients with osteoarthritis was lower than in the group of patients without osteoarthritis (17.86% vs. 25.17%). Osteoarthritis was associated with significantly lower BI at discharge and prolonged hospital stay.
Conclusion: Osteoarthritis impairs recovery from stroke and negatively impacts health-related quality of life (HRQoL) in stroke patients. Therefore, these patients require longer lengths of stay for inpatient medical rehabilitation. Osteoarthritis needs to be considered when planing the rehabilitation treatment for stroke patients.

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P743

EFFECTS OF RESISTANCE TRAINING ON TIBIAL STRUCTURE IN POSTMENOPAUSAL WOMEN: THE REPROOF STUDY

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Objective High-load conventional resistance training (CRT) is recommended to prevent bone loss. Ballistic resistance training (BRT) maximises power by explosively lifting light/moderate loads. This study investigated the effects of CRT and BRT, relative to control (CON), on tibial structure in postmenopausal women.
Methods The Resistance Exercise Programme on Risk of Osteoporosis and Osteoarthritis in Females (REPROOF) trial, randomised healthy postmenopausal women (>4 years) into BRT, CRT, or CON. The BRT and CRT involved supervised resistance training with hack squats and calf raises twice weekly for 8 months, with training loads of 20-50% and 60-80% 1-repetition maximum, respectively. Peripheral quantitative computed tomography (Stratec XCT2000L, voxel size 0.5mm, slice thickness 2 mm) was used to scan at 66% of the left tibia length. Cortical volumetric BMD (vBMD), thickness, and circumferences were analysed, and the BoneJ plug-in for ImageJ analysed mass/density distribution around the centre of bone mass (polar distribution) and through the bone cortex (radial distribution) (figure 1A). Paired t-tests and ANCOVA with baseline values as covariates assessed within-group and between-group comparisons, respectively.
Results Of 109 randomised participants, 76 (27 BRT, 26 CRT, 23 CON, mean age 63.1±3.7) completed the training programme and had available scans. The mean training adherence was ~98% in both groups. When adjusted for baseline values, there was a significant increase in cortical vBMD (mean difference: 3.18 (CI:0.05,6.31)) mg/cm^3, P=0.047), and a decrease in cortical thickness (mean difference: 0.07 (CI:-0.13,-0.01, mm P=0.033) in the CRT relative to CON. This was due to a greater percentage increase in endosteal (1.7%, P=0.012) than pericortical circumference (0.8%, P=0.034) in the CRT group. Local cortical mass increased by 1.3% in the anterior-lateral tibia region in CON (P=0.034) only. CRT significantly increased pericortical radial density distribution by 0.3% (P=0.045) with no change at the endo- and mid-cortical distribution. No significant structural adaptations were observed in the BRT group compared to CON.

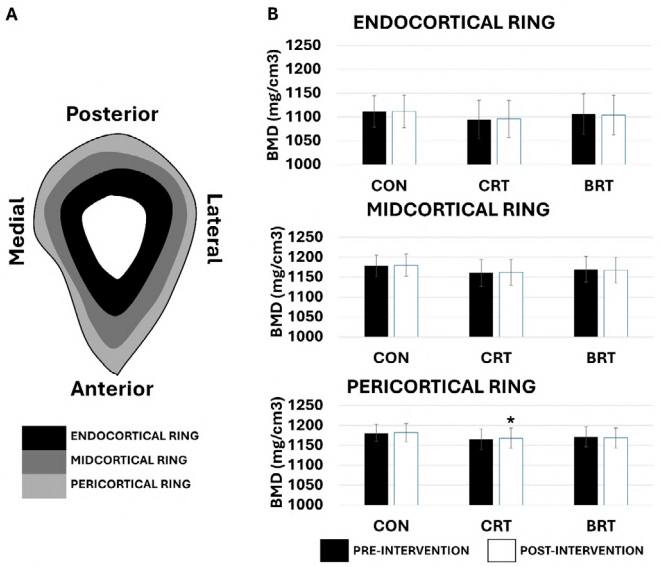

Figure1: A) regions of interest B) Mean±SD cortical BMD (g/cm3)
*post different from pre-intervention P<0.05

Conclusion CRT produced greater structural adaptations than BRT and CON, involving cortical expansion and increased vBMD, particularly in the pericortical ring at the mid-tibia shaft. This adaptation may increase strength in bending, which would be expected to reduce fracture risk.

P744

BONE MINERAL DENSITY IN ADULTS WITH DOWN'S SYNDROME: A CROSS-SECTIONAL STUDY IN A BRAZILIAN SAMPLE

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Background
We aimed to investigate the relationship between bone mass in a sample of Brazilian individuals with Down's syndrome (DS) and handgrip strength, body mass index (BMI), and physical exercise.
Methods
Dual-energy X-ray absorptiometry was used to analyse bone mass in 26 individuals with DS (8 men and 18 women, mean age 30.7 ± 10.3 years). Weight and height were measured to calculate BMI, handgrip strength was assessed using a Jamar dynamometer®, and physical activity levels were classified using the International Physical Activity Questionnaire (IPAQ).
Results
In this sample, 2/15 (13.3%) individuals aged 18 to 29 years had low BMD in the spine; 2/8 (25%) of those aged 30 to 39 years also had low BMD in the spine, and 2/3 (66.6%) of those aged ≥40 years had low BMD in the femur. Significant correlations were observed between handgrip strength and femoral neck Z-score in women (P = 0.02) and between BMI and femoral neck Z-score in men (P = 0.04). All other correlations were not statistically significant (P > 0.05).
Conclusions
Brazilian patients with Down's syndrome showed a high prevalence of low bone mass. Traditional factors such as muscle strength, BMI, and physical activity appear to have minimal influence on bone mineral density in this population.

P745

DIFFERENT DOSE OF VITAMIN D SUPPLEMENTATION AND ITS EFFECTS ON OSTEOPOROSIS PATIENTS IN LATVIA: A 5-YEAR RETROSPECTIVE STUDY REAL-WORLD DATA AT THE RIGA EAST UNIVERSITY HOSPITAL (REUH)

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Objectives. Osteoporosis is a condition that causes bones to become weak and porous. Vitamin D may help with osteoporosis because of its role in bone growth and remodelling. If a person with osteoporosis regularly obtains adequate amounts of vitamin D, it can help promote calcium absorption, which is essential for good bone health and is associated with a lower risk of fractures. This research aims to investigate patients with osteoporosis in Latvia, focusing on their intake of supplements and the effects of those supplements.
Materials and Methods. A retrospective study analyzed data from 505 unique osteoporosis patients treated at REUH, all treated in one centre. Data were collected from 2020 to 2024 and analyzed using IBM SPSS 29.0.
Results. Of 505 patients with a mean age of 68.3±9.4SD years, 90.3% (n=456) were female, 37.6% (n=190) of patients have had fractures, of which 74.7% (n=142) occurred before they started osteoporosis therapy. Calcium supplements 500mg were taken by 82.4% (n=416) daily. Vitamin D by 89.3% (n=451). The prescribed vitamin D doses ranged from 1000IU daily to 50000IU weekly. 18.6% (n=8) of patients who had fractures while receiving osteoporosis treatment had vitamin D levels below 30±0.1ng/ml, compared to only 11.8% (n=40) of all other patients. In general, 12.2% (n=53) of patients had vitamin D levels below 30±0.1ng/ml, which dropped to 5.3% (n=24) after one year of adequate supplementation. The largest average increase in vitamin D level over a year was observed in patients who received 8000IU per day, with a 45% increase noted for 32 patients. The most prescribed dose of vitamin D was 4000IU (n=101), which increased levels by 11.4% in a year. Lower vitamin D doses, 1000IU to 2000IU were less effective, with increases below 0.6% or even decreases.
Conclusion. The study found that most patients with osteoporosis take calcium and vitamin D daily. Vitamin D is generally taken in appropriate doses that maintain adequate blood levels.

P746

BONE MINERAL DENSITY, TRABECULAR BONE SCORE AND HIP STRUCTURAL ANALYSIS IN CHRONIC GLUCOCORTICOID USERS ATTENDING A TERTIARY CENTRE IN SOUTHERN INDIA

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Objectives: Glucocorticoids (GC) are used for various chronic medical conditions and is one of the most abused drugs in India. Despite widespread GC use, there is lack of knowledge among physicians regarding assessment and management of glucocorticoid induced osteoporosis(GIO). This study was performed to assess bone mineral density(BMD), trabecular bone score(TBS) and hip structural analysis(HSA) in chronic steroid users.
Material and Methods: An observational study done over eight years. Details of patients were obtained through archived medical records. Bone biochemical parameters and densitometric variables that included bone mineral density(BMD), trabecular bone score(TBS) and hip structural analysis(HSA) were assessed by a DXA(Hologic Horizon) scanner.
Results: A total of 74 subjects (56 females, 45/56 postmenopausal) with a mean(SD) age and BMI of 49.5(12.5) years and 29.0(6.9) kg/m^2 were studied. Vitamin D deficiency was present in 33/74(44.6%) of subjects. Fifteen subjects (20.3%) had sustained fragility fractures. At baseline, the prevalence of osteoporosis/low bone mass at neck of femur and lumbar spine was 24/74(32.4%) and 34/74(45.9%) respectively. Degraded trabecular microarchitecture as defined by a TBS<1.200 was present in 32/74(43.2%) of the subjects. Among those with normal BMD at the lumbar spine, 13/40(32.5%) had a low TBS. Buckling ratio(BR) at the narrow(NN) neck > 10 was seen in 57/74 (77%) of subjects. Among subjects with normal BMD at the femoral neck, 33/50 (66%) had a BR at NN >10, which indicates high fracture risk.
Conclusion: GIO continues to be prevalent among steroid users. TBS and HSA may confer additional benefit regarding bone health, not conveyed by conventional BMD assessment in chronic glucocorticoid users.
References:
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Disclosures: None

P747

UTILITY OF FRAXPLUS® IN PREDICTING RADIOGRAPHIC PREVALENT VERTEBRAL FRACTURES IN IN RURAL SOUTHERN INDIA - A CROSS-SECTIONAL STUDY

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Objectives: The prevalence of vertebral fractures in urban postmenopausal women in India is about 30 - 35%. Dual Energy X-Ray Absorptiometry (DXA) is not widely available in India. In this cross-sectional study we aimed to identify the prevalence of vertebral fractures in rural postmenopausal women and to assess the utility of FRAXplus® in them.
Material and Methods: This was a cross-sectional study done over six months in 150 postmenopausal women presenting to the Medicine and Endocrinology Outpatient Department in a secondary care hospital in rural India. FRAX®, and FRAXplus® (where appropriate) were used for assessment of fracture risk along with X-ray of the thoraco-lumbar spine to identify vertebral fractures (Genant classification). The sensitivity and specificity of FRAXplus® for predefined Indian thresholds and new cut-offs were studied.
Results: The mean (SD) age of the patients was 66.1(6.5) years. The prevalence of moderate to severe vertebral fractures was 34%. Forty-four subjects had FRAX- MOF cut-off ≥ 10.5 and 57 had FRAX-HF cut-off ≥ 3.5. Fifty percent (n=22) of subjects with high FRAX-MOF and 49 % of high FRAX-HF had moderate to severe prevalent radiographic vertebral fractures. FRAXplus® correction was utilized in 34 Subjects (23%) for falls (n-=30) and glucocorticoids(N=4). On ROC analysis (Table 1, Figure 1), FRAXplus®-MOF score cutoff of 10.5 had a sensitivity of 45% and specificity of 73%. A cut-off of 6 had a sensitivity of 80% and 40% specificity for FRAXplus®-MOF and cutoff of 1.5 for FRAXplus®-HF had a sensitivity of 76% and 40 % specificity.
Conclusion: FRAXplus® may be a useful tool in predicting prevalent vertebral fractures in postmenopausal women in a resource limited setting and may be used to guide treatment.

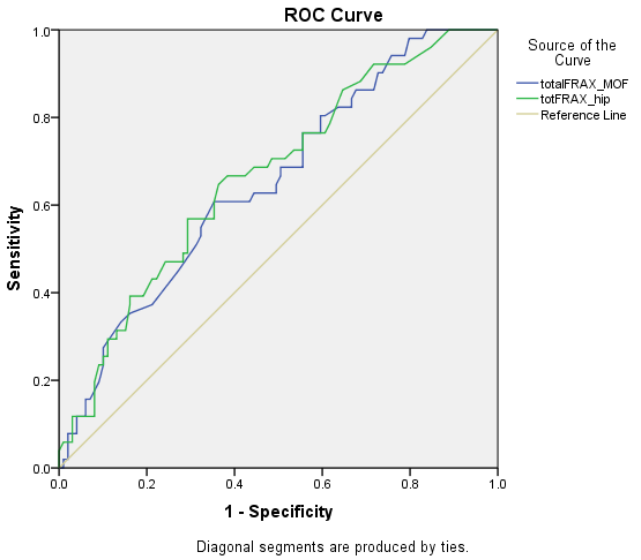

Figure 1: ROC curve of FRAXplus® in predicting vertebral fractures

Test	AUC	95% CI	P-value
FRAXplus MOF	0.653	0.563-0.743	0.003
FRAXplus hip	0.700	0.578-0.758	0.001

Table 1: AUC of FRAXplus® in predicting prevalent vertebral fractures

References:
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P748

WOMEN WITH GRAVES' DISEASE HAVE DERANGED PROXIMAL HIP GEOMETRY, TRABECULAR BONE SCORE AND BODY COMPOSITION PARAMETERS: A CASE-CONTROL STUDY FROM SOUTHERN INDIA

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Objectives: While it is well known that hyperthyroidism is associated with decreased bone mineral density, other DXA-derived indices such as proximal hip geometry and body composition parameters have not been well studied in India. The present study was undertaken to comprehensively assess DXA-derived parameters in premenopausal women aged 25-45 years, and to compare these matched female controls.

Materials and Methods: A case-control study done over a period of one year. DXA-derived parameters such as bone mineral density (BMD), trabecular bone score (TBS), hip structural analysis (HSA), body composition and bone biochemical parameters were assessed.

Results: Forty-one premenopausal subjects with hyperthyroidism and 74 age and BMI matched controls were recruited. The mean (SD) ages of cases and controls were 34.5(6.3) and 33.8(5.2) years respectively. The bone turnover markers (C-terminal telopeptide of type 1 collagen and N-terminal pro-peptide of type 1 procollagen) were significantly higher among cases as compared to controls (P<0.001). The BMD at lumbar spine(LS), neck of femur (NOF) and trabecular bone score were significantly lower in cases when compared to controls (p<0.05). Several parameters of proximal hip geometry at all 3 sites were impaired in subjects with Graves' disease as compared to controls (Table 1). A significantly greater proportion of cases had sarcopenia when compared to controls (27% versus 1.4 %; p<0.001)

Conclusion: In rural premenopausal subjects from southern India, with hyperthyroidism, a comprehensive assessment utilizing BMD, TBS and HSA may be used for a holistic evaluation of bone fragility.

Table 1: Comparison of DXA-derived parameters between cases and controls

DXA variables	Cases (n=41)	Controls (n=73)	P-value
BMD			
Lumbar spine BMD (g/cm^2)	0.910±0.101	0.975±0.114	0.002
NOF BMD (g/cm^2)	0.737±0.111	0.791±0.117	0.016
Hip BMD (g/cm^2)	0.857±0.123	0.903±0.122	0.061
TBS	1.330±0.073	1.370±0.077	0.028
HSA-NN			
CSA (cm^2)	2.57±0.34	2.83±0.50	0.015
CSMI (cm^4)	1.81±0.44	1.97±0.36	0.090
Z (cm^3)	1.09±0.19	1.22±0.20	0.008
BR	9.7±2.8	8.8±2.8	0.156
HSA-IT			
CSA (cm^2)	4.56±0.81	5.06±1.10	0.037
CSMI (cm^4)	10.81±2.91	11.92±3.22	0.132
Z (cm^3)	3.57±0.80	3.90±0.93	0.123
BR	7.9±1.8	7.3±1.4	0.132
HSA-FS			
CSA (cm^2)	3.47±0.52	3.70±0.54	0.075
CSMI (cm^4)	2.53±0.60	2.83±0.71	0.062
Z (cm^3)	1.73±0.31	1.88±0.33	0.053
BR	3.1±0.6	3.0±0.6	0.506
HAL	96.44±4.506	94.09±5.288	0.049
Body composition analysis			
Total body fat (%)	37.6±6.6	34.9±4.2	0.029
Appendicular lean / height^2 (kg/m^2)	5.8±0.9	6.9±1.8	< 0.001

DXA – Dual Energy X-ray Absorptiometry; BMD – Bone Mineral Density; NOF – Neck of Femur, TBS – Trabecular Bone Score; HSA – Hip Structural Analysis; NN – Narrow Neck; CSA – Cross Sectional Area; CSMI – Cross Sectional Moment of Inertia; Z – Section Modulus; BR – Buckling Ratio; HAL – Hip Axis Length; IT-Inter-Trochanteric region; FS - Femoral Shaft

Disclosures: None

References:

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P749

EXPLORING THE BMD-TBS-BSI PARADOX IN PATIENTS WITH END-STAGE KIDNEY DISEASE – AT BASELINE, ACROSS THE TRANSPLANT TRANSITION AND BEYOND: A PROSPECTIVE STUDY

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Objectives: Much remains unknown with regards changes in densitometric indices following renal transplant in Asians with end-stage kidney disease(ESKD). This prospective study aimed to comprehensively assess bone health in renal transplant recipients at baseline and at 3, 12, and 48-months post-transplant.
Material and Methods: A prospective study in which consecutive patients with ESKD scheduled for renal transplant were recruited. Evaluation included renal and bone biochemical parameters and densitometric indices such as bone mineral density (BMD), trabecular bone score (TBS) and the bone strain index (BSI) at baseline, and at 3, 12, and 48-months post-transplant.
Results: A total of 53 patients(Females =15) were recruited. The mean (SD) age was 33.9(10.3) years. A repeated measures ANOVA showed that the mean BMD at the total hip and distal forearm showed an improving trend; the lumbar-spine BMD did not significantly differ during the period of follow-up. However, the TBS showed a significant decline from baseline to 4 years (P=0.001). The BSI of the lumbar spine increased progressively, indicating a higher tendency to fracture(Figure 1). Incident vertebral fractures occurred in 3 patients in the first year. Concentrations of parathormone, creatinine, phosphate, C-terminal telopeptide of type 1 collagen and N-terminal telopeptide of type 1 procollagen differed significantly between time points (P < 0.01).
Conclusion: This prospective study in renal transplant recipients showed BMD at all sites to be stable. Paradoxically, the TBS and BSI continued to deteriorate. Incorporating TBS and BSI in addition to conventional BMD assessment in renal transplant recipients is required to gain insights into the qualitative aspects of bone strength.

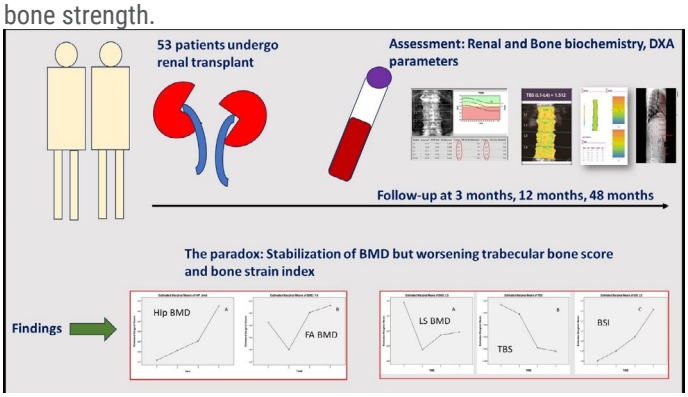

Figure 1: The BMD-TBS-BSI paradox

Disclosures: None
References:
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P750

BONE FRAGILITY IN ACROMEGALY – HOW DO DENSITOMETRIC INDICES PERFORM? A CASE CONTROL STUDY FROM INDIA

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Objectives: While growth hormone (GH) is a bone anabolic hormone, its persistent elevation is associated with increased bone turnover and deterioration of bone health. Bone fragility in individuals with acromegaly is not well studied in India. This study was undertaken to assess the performance of various densitometric indices in assessing bone health in patients treated for acromegaly.
Materials and Methods: A case-control study in which individuals with a GH-secreting pituitary adenoma, operated in the last ten years were recruited over a period of two years. Bone mineral parameters and densitometric indices including bone mineral density (BMD), prevalent vertebral fractures, trabecular bone score (TBS), hip structural analysis (HSA) and bone strain index (BSI) were studied.
Results: A total of 50 subjects operated for acromegaly were recruited at a median duration of 3 (1-10) years post-surgery and compared with 53 controls. The mean (SD) age of the cases and controls were 40.2 (11.9) and 40.5 (11.9) years respectively. The BMD at the neck of femur and forearm were significantly higher in cases. While the lumbar spine BMD was not significantly different between cases and controls, the TBS was significantly lower among cases as compared to controls (Table 1). The prevalence of vertebral fractures was higher among cases (34%) as compared to controls (17%); P=0.04. Parameters of hip structural analysis was enhanced in cases; BSI was not significantly different between the two groups.
Conclusion: Prevalent vertebral fractures and trabecular bone score may be better indices of bone fragility in individuals with acromegaly as compared to bone mineral density as a standalone measure.
Table 1: Comparison of BMD and TBS between cases and controls

Parameters	Cases (N-50) Mean±SD	Control (N-53) Mean±SD	P-value
Femoral Neck BMD (g/cm^2)	0.849±0.123	0.770±0.144	0.013
Lumbar Spine BMD (g/cm^2)	0.995±0.135	0.990±0.169	0.893
Forearm BMD (g/cm^2)	0.740±0.698	0.697±0.100	0.047
Trabecular Bone Score	1.301±0.090	1.344±0.090	0.023

Disclosures: None

References:

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P751

TBS-ADJUSTED T-SCORES AND BONE STRAIN INDEX PRESENT A NEW PARADIGM IN EVALUATING BONE FRAGILITY IN INDIAN POSTMENOPAUSAL WOMEN: A CROSS-SECTIONAL STUDY

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[1]Christian Medical College Vellore, VELLORE, India

Objectives: Trabecular Bone Score (TBS) has been incorporated as an input variable in FRAX to improve fracture risk prediction. An alternate approach for using TBS in clinical practice was recently proposed based on a risk-equivalent offset adjustment to bone mineral density (BMD) T-scores. Bone Strain index (BSI) is a novel densitometric tool that indicates the level of strain inside the bone. This study was undertaken to assess the utility of the TBS-adjusted BMD T-scores and BSI in prevalent vertebral fractures in Indian postmenopausal women.

Materials and Methods: A cross-sectional study in which 560 community dwelling postmenopausal women aged over 50 years were recruited. Bone biochemical parameters and densitometric indices such as bone mineral density (BMD), trabecular bone score (TBS), prevalent vertebral fractures and bone strain index were assessed. TBS-adjusted BMD T-scores were computed from previously described formulae.

Results: The mean (SD) age of the study participants was 59.4(6.8) years. Prevalent moderate-severe vertebral fractures was present in 165/560 (29.4%) of individuals. Among the DXA-derived indices at the lumbar spine, the odds of prevalent vertebral fractures was highest with TBS-adjusted lumbar spine T-score (OR=1.8; 95% CI: 1.2-2.6) followed by lumbar spine BSI (OR=1.5; 95% CI=1.0-2.1) and unadjusted lumbar spine T-score (OR=1.4; 95% CI: 0.9-2.0). The sensitivity for detection of prevalent vertebral fractures was highest with the femoral neck BSI followed by the TBS adjusted T-scores at the lumbar spine and BSI at the lumbar spine. and (Table 1).

Conclusion: TBS-adjusted BMD T-scores and BSI had a higher sensitivity in detecting prevalent vertebral fractures and may be a new paradigm in assessing bone fragility in Indian postmenopausal women, not captured by standalone BMD measurements.

Table 1: Performance of various densitometric indices in deetecting prevalent vertebral fractures

Parameter	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
LS BMD T-score	46.1	62.5	33.9	75.7
FN BMD T-score	36.9	81.5	45.5	75.5
TBS adjusted LS BMD T-score	54.5	60.5	36.5	76.1
TBS adjusted FN BMD T-score	41.2	75.1	40.9	75.4
High LS BSI	53.9	56.4	34.1	74.5
High FN BSI	58.7	53.9	34.7	75.8

T-score cut-off: ≤ minus 2.5

BSI cut-off: ≥ 1.68

Disclosures: None

References:

1. Leslie WD, Shevroja E, Johansson H, et al. Risk-equivalent T-score adjustment for using lumbar spine trabecular bone score (TBS): the Manitoba BMD registry. Osteoporos Int. 2018 Mar;29(3):751-758. doi: 10.1007/s00198-018-4405-0.

P752

OSTEOPOROSIS TREATMENT INDICATION AFTER RECENT FRACTURE: IMPORTANCE OF INDEX FRACTURE SITE – A RESTROSPECTIVE COHORT STUDY

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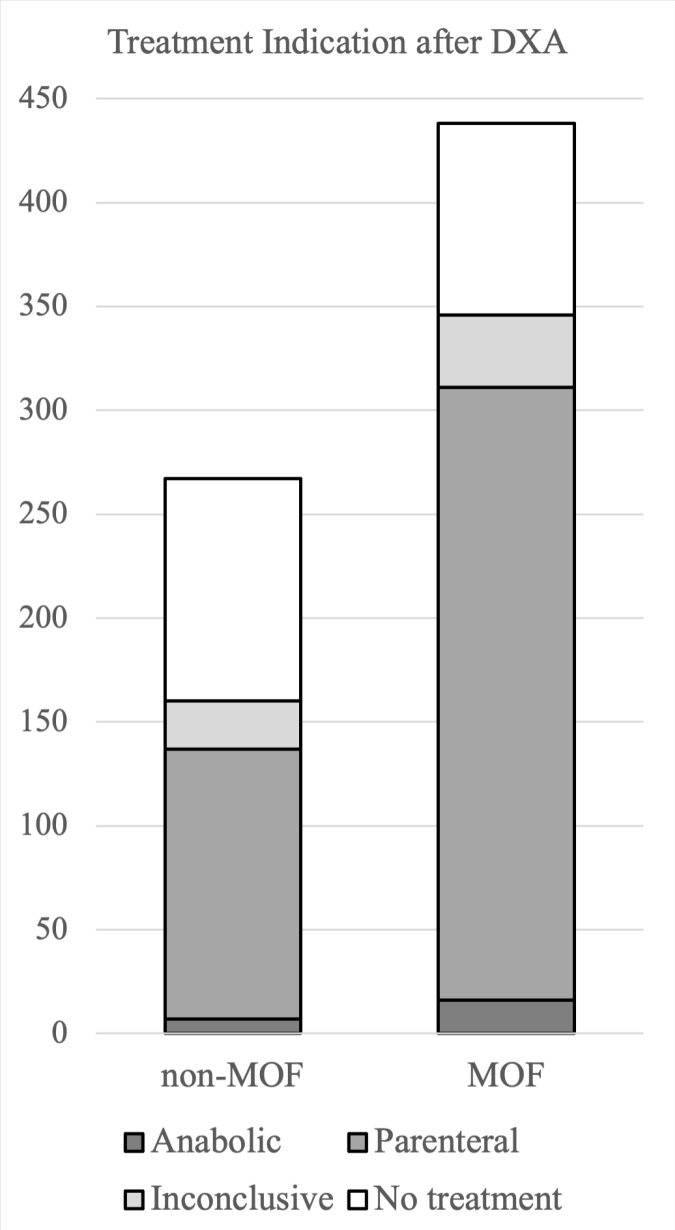
Background: Fracture Liaison Services (FLS) identify patients with recent fractures and after investigation provide treatment to prevent subsequent fractures. Traditionally, many services has been limited to include only Major Osteoporotic Fractures (MOF, i.e. fractured vertebrae, hip, proximal humerus, wrist, and pelvis). However, recent studies have found that recent fractures at other bone sites are also associated with increased risk for subsequent fracture. This study aimed to compare key characteristic, fracture risk factors and indication for osteoporosis treatment in patients with a recent non-MOF to patients with recent MOF after being included in an FLS at Skaraborg Hospital in Skövde, Sweden.

Methods: Patients with a bone mineral density (BMD) measurement between December 2023 and May 2024, with a recent fracture and 50 years or older were included (N=705). The patients' age, sex, FRAX risk factors, FRAX-score, BMD, trabecular bone score, vertebral fracture (VF) assessment identified VFs, and physician issued osteoporosis treatment recommendation after the FLS evaluation were collected. Differences non-MOF vs MOF were analyzed using t-test, chi-square tests and standardized mean differences. The odds ratio (OR) for receiving a recommendation (yes/no) to provide the patient with osteoporosis medication was calculated using logistic regression non-MOF vs MOF, with

increasing levels of adjustment for confounders.
Results: There were high rates of osteoporosis treatment indication in both non-MOF (51%) and MOF (71%) patients, and corresponding low numbers needed to screen to identify 1 patient with osteoporosis treatment indication, in both non-MOF (1.95) and MOF patients (1.41). There were similar characteristics and risk profiles in both non-MOF and MOF patients with osteoporosis treatment indication.
Conclusion: Patients with recent non-MOF and MOF should all be included in secondary prevention programs, since the proportions with treatment indications are high regardless of fracture category.



P753

INTRODUCING FREM_ML: MACHINE LEARNING FOR AUTOMATED IDENTIFICATION OF INDIVIDUALS AT HIGH IMMINENT FRACTURE RISK IN GENERAL PRACTICE

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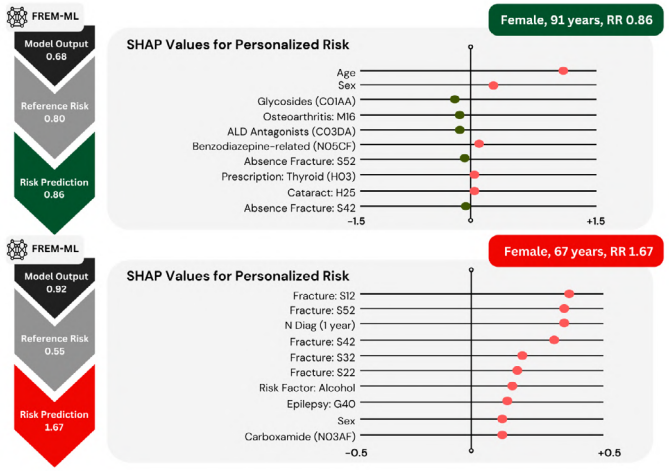
Objective
To innovate the Danish Fracture Risk Evaluation Model (FREM) using machine learning to better predict the imminent (one-year) risk of major osteoporotic fractures (MOFs) in the Danish population ≥45 years
Material and Methods
The $FREM_{ML}$ Dropouts meet multiple Additive Regression Tree (DART) boosting algorithm was trained and validated using complete registry data extracted for the Danish population ≥45 years without previous osteoporosis diagnoses or osteoporosis-related treatment (N=2,472,912). Predictors of MOFs (2022), automatically extracted for the 15-year lookback period (2007-2021), included hospital diagnoses, filled medication prescriptions, days since last redemption of fall- and osteoporosis-specific risk medication, and markers of polypharmacy and multi-morbidity. Model outputs were evaluated in the context of explainable artificial intelligence (AI). Risk prediction outputs were backed by SHapley Additive exPlanations (SHAP) values
Results
$FREM_{ML}$ displayed an overall area under the curve (95%CI) of 0.77 (0.76, 0.77) – making it superior to previous versions of FREM. While age and sex were the most relevant predictors of MOF events, advanced feature engineering, including temporal information, contributed to model performance. Importantly, SHAP values allowed for the clinical interpretation of predicted relative risks considering age and sex. Two case examples are shown in Figure 1: a 67-year-old female at elevated risk and a 91-year-old female at lower risk compared to a female of the same age.
Figure 1: Case Examples



Conclusion

The open-source FREM$_{ML}$ boosting model, enhanced by explainable AI, provides an effective decision-support tool for identifying individuals at high imminent risk of fractures, supporting physicians in deciding who to refer for dual-energy X-ray absorptiometry. By incorporating age- and sex-specific thresholds, this system offers a promising approach to improving primary detection of osteoporosis and preventing fractures in an aging population

P754

RELATIONSHIP BETWEEN FASTED GLYCATED HEMOGLOBIN (HBA1C) AND TRABECULAR BONE SCORE ADJUSTED FOR TISSUE THICKNESS (TBS OSTEO, VERSION 4)

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Objective:

Trabecular bone score (TBS) is a validated index of bone microarchitecture, used alongside bone mineral density (BMD) to enhance the assessment of bone health and fracture risk. Previous studies demonstrate associations between TBS, type 2 diabetes and glycemic control, but TBS version 3, adjusted for body mass index (BMI), may not fully account for increased central adiposity. The new TBS version 4 adjusts for tissue thickness, addressing this limitation. Therefore, this study compares TBS v3 and v4 in their relationships with glycated hemoglobin (HbA1c), a marker of glycemic control.

Methods:

In this single center study, 111 male and female (65%) participants (mean age: 50.8±9.5 years) received dual-energy X-ray absorptiometry scans (GE iDXA) of the lumbar spine to derive TBS and BMD, and the total body, for visceral fat. Fasting blood samples were collected during the same visit and analysed for HbA1c.

Results:

The mean values for the cohort were: HbA1c, 35.4±3.1 mmol/mol (range: 28.0–45.0); BMI, 25.4±3.8 kg/m² (range: 19.1–36.7); TBS v3, 1.41±0.1 (1.12–1.63); and TBS v4, 1.38±0.1 (1.11–1.62). TBS v3 and v4, but not BMD, were negatively correlated with age. No significant correlations were observed between BMI or tissue thickness, for either TBS version, whereas BMD was positively associated with BMI. Furthermore, no associations were observed between BMD and HbA1c. In contrast, both TBS v3 and v4 were negatively associated with HbA1c ($P < 0.01$).

Conclusion:

The negative associations between TBS, derived using both v3 and v4 software, and HbA1c suggest that poorer glycemic control is linked to reduced bone quality, as reflected in lower TBS values. In contrast, no such relationship was observed with BMD. Mechanistically, hyperglycemia may impair bone quality by driving the accumulation of advanced glycation end-products in collagen, which weakens trabecular integrity. These findings underscore the value of TBS, offering insights beyond those provided by BMD.

	Lumbar Spine BMD	TBS version 3, BMI adj.	TBS version 4, Tissue Thickness adj.
Age	-0.134	**-0.472***	**-0.427***
Body Mass Index	**0.272***	0.106	-0.05
Tissue Thickness	0.179	-0.08	-0.11
Glycated Hemoglobin	-0.03	**-0.261***	**-0.247***

Table 1. Correlations between HbA1c, Lumbar Spine BMD and TBS (Version 3 and 4) *p<0.01

Disclosures: K Hind, G Gatineau, M Davies and M De Gruttola are employees of medimaps group SA, developers of TBS iNsight™ software. D Hans is co-owner of the TBS patent, has corresponding shares and is CEO at medimaps group.

P755

ADVANTAGES OF USING BIOACTIVE GLASS 60S IN PATIENTS WITH DIAPHYSEAL BONE DEFECTS CAUSED BY BLAST INJURIES

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Objective: Filling diaphyseal bone defects in patients with blast injuries is a challenging problem often complicated by infectious processes. Bioactive materials, particularly bioactive glass 60S, are used in accordance with the Masquelet technique, which provides prolonged local antimicrobial effects, rapid material remodeling, and bone tissue consolidation. This study compares the effectiveness of bioactive glass 60S with calcium-based materials,

which are the standard for defect replacement.
Materials and Methods: The bioactivity of Cu-doped bioactive glass 60S was studied in vitro in SBF Kokubo solution using SEM-EDX, FTIR, XRD, and ICP-AES methods. The study included 45 patients with gunshot fractures and diaphyseal bone defects ranging from 5 to 7 cm (mean size: 6.2 ± 1.1 cm), confirmed through radiographic and CT imaging. The patients were divided into two groups: the main group (n=21) received bioactive glass 60S, while the control group (n=24) was treated with calcium-based materials. Treatment outcomes were assessed at 12 and 18 months using radiographic examinations and the Lane-Sandhu scale, where 3 points indicate active consolidation and 4 points indicate complete consolidation and material remodeling.
Results: Bioactive glass 60S demonstrated high bioactivity and ion exchange activity, promoting the formation of a hydroxyapatite layer and the remodeling of the material into bone tissue. It exhibited pronounced antimicrobial activity against *Ps. aeruginosa* and *Kl. pneumoniae* but no effect against *St. aureus*. Recurrences of infectious processes occurred in one patient (4.76%) from the main group after 3 months and in two patients (8.33%) from the control group after 22 and 30 days postoperatively; these patients were excluded from further analysis. After 12 months, 45% of patients (9 of 20) in the main group achieved complete consolidation (4 points), while 55% (11 patients) showed partial consolidation (3 points). At 18 months, all patients in the main group achieved complete consolidation (4 points). In the control group, after 12 months, only 27.3% of patients (6 of 22) achieved complete consolidation, while 72.7% (16 patients) demonstrated partial consolidation (3 points). At 18 months, 59% of control group patients (13 individuals) achieved 4 points, while 41% (9 patients) remained at 3 points.
Conclusions: Cu-doped bioactive glass 60S demonstrates high bioactivity, facilitates rapid bone tissue consolidation, and provides prolonged antimicrobial effects, particularly against gram-negative microorganisms. It surpasses calcium-based materials in tissue remodeling speed and effectively reduces the risk of infection recurrence. The use of bioactive glass 60S is a promising approach for treating diaphyseal bone defects in patients with blast injuries.
Keywords: *Bioactive glass 60S, Cu-doped bioactive glass, diaphyseal bone defects, blast injuries, Masquelet technique*

P756

APPLICATION OF VDMT TECHNIQUE IN PATIENTS WITH LOWER LIMB AMPUTATION DUE TO MINE-EXPLOSION INJURIES

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Relevance: The formation of peripheral nerve neuromas is a common cause of chronic pain in the late postoperative period among patients with limb amputations. The standard approach to nerve management is distal nerve resection. According to recent data, the use of the VDMT technique prevents neuroma formation, facilitates early prosthetic fitting, and reduces the need for repeated surgical interventions.
Materials and Methods:
From 2022 to 2024, 46 patients with lower limb stumps after amputation due to mine-explosion injuries, with pain syndrome and ultrasound-confirmed peripheral neuromas were included in the study. Pain levels were assessed using the Visual Analog Scale (VAS). All patients underwent surgical treatment. Patients were divided into two groups: the main group (n=23), who underwent peripheral nerve management with the VDMT technique, and the control group (n=23), who underwent distal nerve resection. Pain reassessment was conducted 3 and 6 months after surgery.
Results: Pain levels in both groups were evaluated using the VAS, with a preoperative mean score of 7.91 ± 1.15. At 4 months, the mean VAS score for the main group was lower (2.95 ± 0.64) compared to the control group (3.17 ± 0.80), the t-test showed difference was not statistically significant ($t = -1.03$, $p = 0.309$). At 6 months, the mean VAS score for the main group (2.23 ± 0.60) was significantly lower than that of the control group (5.79 ± 0.87), with a highly significant result ($t = -16.15$, $p < 0.001$), indicating much better pain relief in the main group. Ultrasound re-evaluation at 6 months revealed recurrent peripheral neuromas in 10 patients (43.47%) in the control group, while none were detected in the main group.
Conclusion: The VDMT technique effectively prevents neuroma formation in patients with limb amputations, reduces pain levels, and decreases the recurrence rate of neuromas. This improves patients' quality of life, accelerates prosthetic fitting, and reduces the need for repeat surgeries.
Keywords: limb amputation, VDMT technique, neuroma, post-amputation pain, stump neuroma, symptomatic neuroma, pain neuroma, Visual Analog Scale (VAS).

P757

COMPARATIVE PAIN INTENSITY BETWEEN FIRST AND SECOND STAGE BILATERAL TOTAL KNEE ARTHROPLASTY

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Background: Total knee arthroplasty (TKA) is a common surgical procedure for managing end-stage knee osteoarthritis, particularly in patients requiring bilateral intervention. Staged bilateral TKA is often performed to minimize risks. Previous studies suggest increased postoperative pain after the second stage, but findings remain inconsistent.
Methods: A retrospective analysis was conducted on 175 patients who underwent staged bilateral TKA. Pain scores, opioid consumption, and length of hospital stay were recorded for each stage. Patients were categorized by the interval between surgeries (<6 months, 6–12 months, and >12 months). Statistical analysis employed linear mixed-effects models and subgroup comparisons.

Results: Pain levels were not significantly different between the first and second TKA stages. Opioid consumption was comparable across both stages. Subgroup analysis based on the inter-surgery interval revealed no significant pain differences between the groups. Sensitivity analysis supported these findings, although a minor reduction in pain after the second stage was observed.
Conclusions: This study suggests no significant difference in postoperative pain between the first and second stages of staged bilateral TKA. Pain outcomes were consistent across different inter-surgery intervals, offering flexibility in scheduling the second procedure. These findings may inform clinical decision-making for pain management in staged bilateral TKA.
Keywords: knee osteoarthritis, staged bilateral TKA, postoperative pain, opioid consumption, surgical interval

P758

MUSCLE METABOLISM IN PATIENTS WITH TRAUMATIC SPINAL CORD DISEASE

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Objective: The purpose of this study was to study the condition of muscle tissue in patients with traumatic spinal cord disease, depending on the duration and level of spinal cord injury.
Methods: We examined 90 male patients suffering from traumatic spinal cord disease, aged 26-45 years, with varying duration of illness. Lesions of the cervical spine were found in 18, thoracic spine in 22, and lumbar spine in 50 patients. Together with conventional research methods, the number of CD3 lymphocytes was determined using immunophenotyping, the content of TNF-α and myoglobin in blood serum was studied by enzyme immunoassay, and the ELISA myoglobin test, which is designed to quantify the concentration of myoglobin in human blood serum as a marker of muscle tissue damage.
RESULTS: A reflection of the severity of metabolic disorders in skeletal muscles is the level of myoglobin, which corresponds to the clinical picture of suffering and its systemic manifestations, the correlations of myoglobin with TNF-α and CD3 indicators in the thoracic region and partially in patients with lumbar spine lesions and are most commonly found in patients with cervical lesions. The dependence of myoglobin levels on the duration of the disease is obvious, and its highest values were observed in patients in the first year of suffering, which were more often associated with altered TNF-α and CD3 values and a decrease in its level in subsequent years of the disease.
Conclusion: in patients with traumatic spinal cord disease, there is a violation of the trophism of skeletal muscles, manifested by an increased level of myoglobin, which is associated with a deterioration in the oxygen supply to tissues, leading to the development of tissue hypoxia. The severity of developing disorders depends on the level of spinal cord damage and the duration of the disease and is caused by concomitant disorders of the systemic order in the patient's body due to the preservation and maintenance of inflammatory activity of the process and the development of endothelial dysfunction.

P759

ADEQUATE DAIRY CONSUMPTION AMONG THE GENERAL POPULATION: FINDINGS FROM A TELEPHONE SURVEY IN SOUTHERN TEHRAN

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Objective: Adequate dairy consumption, along with other contributing factors, can help prevent and manage osteoporosis while promoting overall health. The aim of this study was to investigate the prevalence of sufficient dairy intake among residents of southern Tehran in 2023.
Materials and Methods: A population-based telephone survey was conducted among individuals aged 18 years and older in three primary regions of southern Tehran, Iran. Participants reported their weekly dairy product consumption by indicating the number of days they consumed dairy products and the number of servings on one of those days. Two or more servings of dairy per day were classified as sufficient. A total of 1,311 individuals were selected using stratified random sampling with probability proportional to size (PPS). The data were analyzed using chi-square tests and t-tests.
Results: Out of the participants, 1,170 (89.2%) had low dairy intake, while 141 (10.8%) had sufficient intake. Specifically, 105 females (13.2%) and 36 males (6.9%) met the recommended intake levels ($p < 0.001$). Among participants under 65 years of age, 135 (10.8%) consumed enough dairy, whereas only 6 individuals (9.4%) aged 65 years and older met the recommended intake ($p = 0.715$). In terms of residency, 125 urban individuals (10.7%) and 16 rural individuals (10.9%) had adequate dairy consumption ($p = 0.957$). Average dairy intake was significantly higher among females ($p = 0.035$), younger individuals ($p = 0.039$), and urban residents ($p < 0.001$).
Conclusion: The findings indicate that residents of southern Tehran frequently have inadequate dairy intake. To improve overall nutritional status and health outcomes, there is an urgent need for public health interventions aimed at addressing these dietary deficiencies.
Key words: Dairy products, Prevalence, Telephone survey, Tehran

P760

HEALTHY LIFESTYLE BEHAVIORS AND RISK OF FALLS AMONG THE ELDERLY POPULATION IN IRAN: A NATIONWIDE CROSS-SECTIONAL STUDY

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Objective: The purpose of the study is to assess the relationship between healthy lifestyle and occurrence of falls among elderly people.
Methods: Data for this secondary analysis study came from the STEPS 2021 survey conducted in Iran. Individuals aged 60 years and older who responded who answered to question about fall events in the past 12 months were included in the study population. Fall history was assessed using a question and the lifestyle score was calculated based on several components, including tobacco use, alcohol consumption (AC), diet, body mass index (BMI) and physical activity (PA). Each component was initially scored on a scale 0 to2 points (except AC, which was scored as 0 or 1). the scores for these components were the summed to create the overall healthy lifestyle index (HLI). The HLI scores were categorized into tertiles and classified as poor, moderate and good HLI for tertiles 1,2 and 3. Chi-square and logistic regression were used to assess the odds of falls across the different HLI subgroups.
Results: Among, 3383 older participants with a mean age of 72.9 ±0.10 years, 4.8 (n=149) percent reported experiencing a fall event in the last year. Fall events were more prevalent among participants with unhealthy lifestyles (5.5 percent) compared to those with healthy lifestyle (3.5 percent). Logistic regression analysis indicated that participants with good and moderate healthy lifestyles had a lower risk of falls compared to those with unhealthy lifestyles, after adjusting for age, sex, and comorbid chronic diseases (OR=0.60, p=0.07 and OR=0.77, p=0.291, respectively).
Conclusion: The results of the study indicate that elderly population with healthier lifestyles had a lower odd of falls events in the past year compared to those with unhealthy lifestyles. These results emphasize that the promotion of healthy lifestyle behavior may be considered a potential strategy in reducing fall events and related risks among the elderly.
Keywords: life style, activity, fall, elderly, Iran

P761

THE ASSOCIATION BETWEEN DIETARY HABITS AND FALL RISK IN THE ADULT IRANIAN POPULATION: A NATIONAL CROSS-SECTIONAL STUDY

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Objective: To investigate the association between falls in the past 12 months and dietary habits in the Iranian population aged 18-60 years, defined as adults.
Methods: A cross-sectional analysis was conducted using data from the 2021 Iran STEPS survey. Fall events in the past year were measured with a question from 21525 participants (56.3% female). Dietary habits were assessed using the score calculated from the principal component analysis (PCA) of the items in the questionnaire related to macronutrient intake and eating habits, including: daily meal and snake, breakfast, diary and its types, fruits, vegetables, meat, processed meat, sweated drinks, fish, whole grains, and nuts. The dietary habits score was divided into tertiles, with a higher score indicating healthier habits. In addition to demographic variables such as age, sex, and employment status, BMI and the comorbidity of chronic diseases were adjusted in Multivariable logistic regression.
Result: According to the survey results, 433 participants (mean age; 39.13±0.17) reported a fall event in the last year (2.0%; 95%CI [2.3-2.6] of those under 60 years of ages). Regarding dietary habits, the majority of those who fell had an unhealthy dietary pattern (37.3; 95%CI [32.5-42.5] compared to 31.8% and 30.8% with a partially healthy and healthy dietary pattern, respectively (p=0.122). Logistic regression, adjusting for age, sex, BMI and comorbidity of chronic diseases showed that people with healthy and partially healthy dietary patterns had a 25% and 20% lower risk of falling compared to those with unhealthy dietary patterns (OR=0.75; 95%CI [0.58-0.98] and OR=0.80; 95%CI [0.62-1.02], respectively).
Conclusion: Unhealthy dietary habits are associated with a higher occurrence of falls in individuals under 60 years of age. It seems that consuming a healthy diet and maintaining healthy nutritional habits, such as reducing sugar and salt intake and increasing the consumption of vegetables and fruits, can reduce the risk of falls in the younger population.
Keywords: Diet, Fall, Macronutrient, Healthy Habits, Iran

P762

FREQUENCY OF FALLING IN THE PAST YEAR IN PEOPLE OVER 50 YEARS OLD

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Background: Falling is a significant public health issue among older adults, globally as approximately one-third of older adults experience a fall annually. This study aimed to estimate the annual rate of falling among older adults aged ≥ 50.
Methods: This cross-sectional descriptive investigation included participants who were referred to the bone densitometry clinic in Tehran, Iran. Data concerning falls in the previous year, hypertension, diabetes, cardiovascular disease, the use of anticonvulsant medications over the past year, and the individual's eligibility for osteoporosis treatment were collected through telephone interviews.
Results: The mean age (SD) of the 425 participants was 64.7 (7.1) years, of which 373 (87.7%) were women. Of the study population, 210 (49.4%) aged over 65 years and 223 (52.5%) and 87 (20.5%) had osteopenia and osteoporosis, respectively. During the one year, 95 (22.3%, 95%: 18.6-25.6) falls were recorded. The annual prevalence (95% confidence interval) of falls in women, men, persons <65 years and persons ≥65 years was estimated to be 23.6% (19.5 – 28.2), 13.7% (6.4 – 26.1), 21.3% (16.3 – 27.4) and 23.3% (18.3 – 29.5), respectively. People taking diabetes medication reported a higher prevalence of falls in the last year (55 (27.23%) compared to other groups 40 (17.9%). However, the analysis showed that bone mineral density categories were not significantly associated with the occurrence of falls in the last year (p-value: 0.320). In addition, the data showed that the prevalence of falls in the past year was more common in people eligible for osteoporosis medication compared to those who were not eligible for this medication treatment (26.5% vs. 20.7%, p-value: 0.20), although the difference was not statistically significant.
Conclusion:
Given the high frequency of falls and low bone mineral density in older adults who attend bone densitometry units, fall risk assessment and fall prevention education can help reduce fractures in this high-risk population.
Keywords: Fall; Prevalence; Osteoporosis

P763

ADHERENCE TO OSTEOPOROSIS TREATMENT AMONG THE CLINICAL POPULATION

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Objective: To illustrate the status of candidates for osteoporosis treatment, the referral to a physician, the prescription of osteoporosis medications, and adherence to treatment among individuals referred to a clinic for bone mineral density (BMD) assessment
Methods: Data were collected from participants≥50 years who attended a clinic in Tehran, Iran, for BMD measurements. The demographic data and BMD status were reviewed from their medical records. The FRAX score was calculated using the required data. Individuals with at least one of the following criteria were eligible to start OP treatment: 1) osteoporosis with T-score≤-2.5 in either total hip, femoral neck or spine, 2) osteopenia with -1≤T-score<-2.5 and a history of minor-trauma fracture , 3) a FRAX score ≥3 or ≥20 for hip and major osteoporotic fractures, respectively. The data on osteoporosis management were collected through a telephone interview.
Result: Of the 425 participants with an average age of 64.7±7.1 years, 117 individuals (27.5%,95%CI: 23.4-31.9) were eligible for osteoporosis treatment. Regarding BMD result,18 (15.4%:9.8-23.2) candidates had osteoporosis and (52.9%:43.8-61.9) had osteopenia. Of the candidates for treatment, 110 (94.2% individuals(were referred to a physician. Of the 110 referred subjects, medication was prescribed for 95 (86.3%) patients. Regarding adherence to treatment, only 79 (83.1%) of those who had received a treatment prescription had taken the medication regularly. If we consider the entire eligible population for treatment, the adherence rate is lower, at 67.5%.
Conclusion: The study results showed that one in three patients eligible for osteoporosis treatment does not adhere to treatment properly. Considering the long duration of treatment, patient education and counseling seems essential.
Key word: osteoporosis, adherence, treatment, BMD

P764

EVALUATION OF THE DIAGNOSTIC ACCURACY OF FRACTURE RISK ASSESSMENT TOOL (FRAX) FOR OSTEOPOROSIS SCREENING IN WOMEN OVER 50 YEARS IN IRAN

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Objective
Osteoporosis screening is important for early diagnosis and intervention. The Fracture Risk Assessment (FRAX) tool is widely used to estimate fracture risk and guide clinical decisions. This study was conducted with the aim of evaluating the accuracy of FRAX for the osteoporosis screening.
Method
The target population of this study was Iranian women aged 50 years and older. This study was conducted in Hamedan province. Before starting the study, invitations to participate in the study were disseminated in the public communication channels. Participants with informed consent to participate who had inclusion criteria and lacked exclusion criteria were included in the study. The required data for FRAX risk calculations were collected with questionnaires, and Dual-energy X-ray Absorptiometry (DXA) method using the GE Lunar device was used to determine bone mineral density (BMD) as the gold standard test. The t-score in at least total hip, femoral neck, or spine under -1 classified as osteopenia and under -2.5 classified as osteoporosis. The diagnostic accuracy of the FRAX score was evaluated as a quantitative variable and assessed by the Receiver Operating Characteristic (ROC) curve.
Results
In total, 995 females over 50 years were included in this study. The mean age of participants was 71.59±6.25 years, and the mean BMI of participants was 26.98±4.78 kg/m². The ROC analysis for evaluation of osteoporosis showed good to excellent discriminatory performance across all variables. The area under the curve (AUC) for detecting osteoporosis in the spine, femoral neck, total hip, and detecting in at least one of these areas was 0.74, 0.93, 0.89, and 0.79, respectively. In addition, FRAX showed high discriminatory performance for evaluating osteoporosis or osteopenia in the spine, femoral neck, total hip, and detecting the condition in at least one of these areas, with AUCs of 0.73, 0.91, 0.88, and 0.88, respectively.
Conclusion
The results of this study showed that FRAX has good to excellent discriminatory performance for detecting osteoporosis and osteopenia, with the highest accuracy observed in the femoral neck and total hip regions.
Keywords: Fracture Risk Assessment Tool, osteoporosis, screening, diagnostic accuracy, osteopenia.

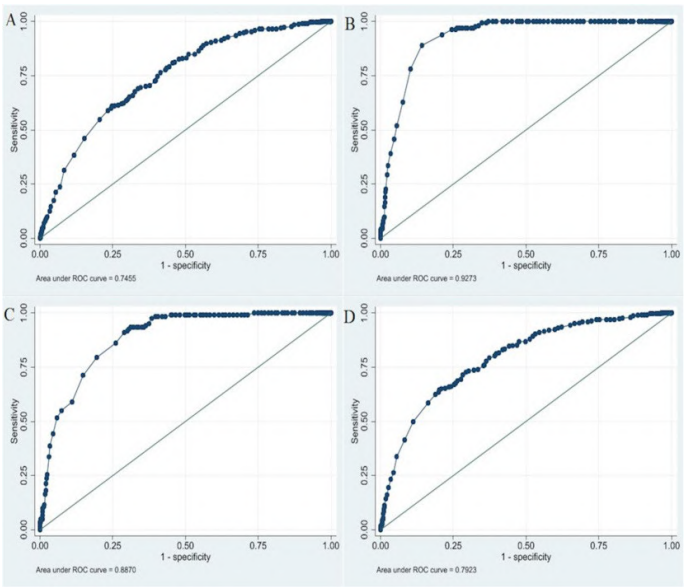

Figure 1: Receiver Operating Characteristic (ROC) curve of FRAX in detecting osteoporosis in A: spine, B: femoral neck, C: total hip, and D: detecting in at least one of these areas.

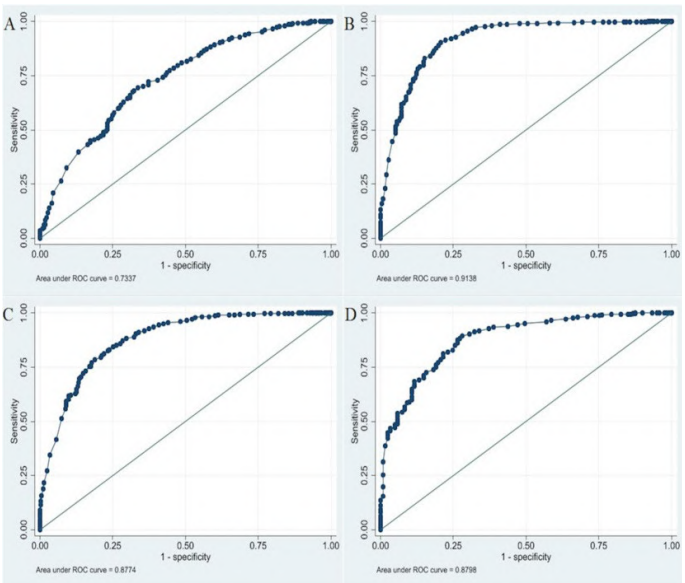

Figure 2: Receiver Operating Characteristic (ROC) curve of FRAX in detecting osteopenia/osteoporosis in A: spine, B: femoral neck, C: total hip, and D: detecting in at least one of these areas.

P765

REHABILITATION OF A PATIENT WITH SARCOPENIA ON THE BACKGROUND OF MOTOR DISORDERS DUE TO STROKE: THE CLINICAL CASE

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Background. Rehabilitation of patients with secondary sarcopenia on the background of motor disorders due to stroke is difficult due to the lack of knowledge of this problem.
Objective: to describe the experience of complex rehabilitation of a patient with sarcopenia on the background of a stroke using a complex rehabilitation method with the use of electrostimulation and robotic mechanotherapy with biological feedback (BF).
Description of the clinical case. In April 2024 a man of 65 years old applied for physical rehabilitation with a diagnosis early recovery period of ischemic stroke in the right carotid basin dated 12.12.2023, right-sided moderate spastic hemiparesis, moderate sensory aphasia. The patients complaints were marked weakness and numbness in the lower extremities, fatigue, difficulty moving, inability to stay upright for a long time. Clinical examination revealed general condition of moderate severity, blood pressure 150/90 mmHg, clinical and biochemical blood tests and general urinalysis within the reference values. Sarcopenia risk assessment for the SARC-F questionnaire score was 5 points, the results of the Up and go test was 25 seconds. The lean mass index according to DXA was 1.8 that corresponds to sarcopenia. According to testing data on a robotic complex Con-Trex the maximum extension force (MEF) of the right leg was 548 N, the average extension force (AEF) of the right leg was 383 N and the average extension power (AEP) of the right leg was 19 Watts. The walking speed according to the results of sensory treadmill ergometer measurement was about 21 steps per minute.
The 15-day rehabilitation program included daily group therapeutic wait bearing physical exercises in a gym, medical massage of the lower extremities, laser therapy for the neck-collar zone, occipital protuberance zones and cubital veins, electrical stimulation of the of the back and lower extremities muscles with sinusoidal modulated currents with carrier frequency 2000 Hz and modulation frequency of 25-30 Hz, robotic mechanotherapy with a BF for targeted training of lower extremities and back muscles. Patients condition after completion of 15-day rehabilitation was satisfactory. The Up and go test takes 20 seconds that is motor function has improved. There was a moderate increase in muscle strength: MEF of the right foot increased up to 739 N, AEF of the right leg – up to 3506 N and AEP of the right leg – up to 29 Watts. The walking speed rise up to 35 steps per minute.
Conclusion. The clinical case demonstrates the effectiveness of a complex rehabilitation program includes electrostimulation and robotic mechanotherapy with BF combined with basic non-medicamentous methods in rehabilitation of man with sarcopenia due to stroke.

P766

RESULT OF TOTAL KNEE ARTHROPLASTY IN PRE-OPERATIVE ADREANAL INSUFFICIENCY PATIENTS

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The purpose of this study is to investigate to effect of adrenal insufficiency on the results of TKA.
Materials and Methods: A total of 189 patients (89 knees) treated with TKA from April, 2022 to December, 2022 were enrolled in this study. Levels of serum cortisol and adrenocorticotropic hormone (ACTH) were checked preoperatively. Hydrocortisone 50~75 mg was injected to adrenal insufficient group at 7:00 AM and 4:00 PM on operative day and the following day. We evaluated the range of motion, the knee society knee score and function score at preoperatively and 2 years follow up, and compared the results between non-adrenal insufficiency group (NAI) and adrenal insufficiency group (AI).
Results: Cortisol and ACTH levels were reduced in 36 of 89 patients. All of 85 patients of low cortisol level do not stimulated in ACTH stimulation test. In the adrenal insufficiency group, the knee society score (KSS) improved from 49.8 to 86.8 and the knee society functional score (KSFS) from 42.6 to 89.5 at 2 years follow up. In the control group KSS rose from 51.9 to 84.3 and KSFS from 49.4 to 88.6 during the same period. In adrenal insufficient patients, there were no postoperative complication to include mortality, infection, periprosthetic fracture except skin lesions during operation or postoperatively. There was a case of rupture of quadriceps tendon on the 10th postoperative day which was treated with primary repair.
Conclusion: Based on our study, there was no increased operative and postoperative complications except skin lesions and 1 case quadricepse tendon rupture in patients with adrenal insufficiency group.

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THE ASSOCIATION BETWEEN KNEE OSTEOARTHRITIS AND FRACTURE RISK IN WOMEN AGED 50 AND OLDER: A POPULATION-BASED COHORT STUDY

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Objective
Osteoarthritis (OA) and osteoporosis are prevalent disorders in elderly women, sharing common risk factors such as menopause and aging. Research on the relationship between these conditions showed variable associations depending on the specific site

of osteoarthritis. Previous studies on knee OA—the most common form of OA— showed higher bone mineral density compared to those without. However, the relationship between knee OA and fracture risk still controversial; these inconsistent results may be due to differences in the demographic and clinical characteristics of the study populations. Our study aims to address this gap by focusing on Asian women aged 50 and above.

Material and methods

We used cohort data from the National Health Insurance Service of Korea between 2010 and 2018. Women aged 50 and older, without prior OA before 2010, or conditions such as cancer, rheumatoid arthritis, and with available body mass index (BMI) data, were included. Patients with knee OA were matched at a 1:2 ratio with non-knee OA participants based on age, BMI, and the index year using propensity score matching.

Results

49,198 patients with knee OA were compared with 98,396 non-knee OA controls. The mean age of the study population was 61.9±9.6 years, and the mean BMI was 23.4±2.8kg/m^2. During an average of 9.1 years follow-up, knee OA groups had a 21% higher fracture risk compared to the non-knee OA group, with a significantly higher risk in the first two years after diagnosis. Walking exercise, the use of osteoporosis medication, and calcium or vitamin D supplements were associated with a reduced risk of fractures than the non-use groups (p for interaction <0.05).

Conclusion

Knee OA was associated with an increased risk of fractures in women aged 50 and over, particularly shortly after diagnosis. Walking exercise and the use of osteoporosis medications might be beneficial. Further research is needed, but early management of osteoporosis in knee OA patients could be beneficial.

P768

BILATERAL TOTAL KNEE ARTHROPLASTY WITH THE CORI ROBOTIC SYSTEM: A PROSPECTIVE STUDY

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Objectives: In the literature, there is a debate regarding the performance of bilateral total knee arthroplasty in one surgery. The purpose of the study was to analyze the clinical and radiological results after bilateral knee arthroplasty with the CORI robotic system.

Material and Methods: 50 patients underwent bilateral total knee arthroplasty (1 surgery) using the CORI robotic system. The range of pain improvement, accuracy of mechanical axis correction, range of motion, time to return to activities, and any complication were analyzed. Clinical evaluation was performed using the OXFORD KNEE score, pain was assessed with the VAS scale, and quality of life was assessed with the SF-12. Radiological evaluation consisted of plain radiographs.

Results: There were a total of 33 women (66%) and 17 men (34%), with a mean age of 72.5 years (range 47-82). Patients were mobilized within 10.5 hours (range 8-13 hours) after surgery and the mean hospital stay was 3 days (range 2-4 days). There was a significant improvement in pain and functional status immediately postoperatively, while the restoration of the mechanical axis was complete. Only 2 patients (4%) were transfused. Patients' overall quality of life was significantly better for both SF-12 parameters. All patients returned immediately to their homes without the need for further physical therapy.

Conclusions: The CORI robotic system can provide excellent functional and clinical results even when performing bilateral total knee arthroplasty in 1 operating session. Specialized experience is required, in order to apply all the advantages of robotics and achieve the optimal result while minimizing the risk of complications.

P769

FIXATION OF PERTROCHANTERIC FRACTURES WITH THE TRIGEN INTERTAN NAIL: TIPS AND TRICKS

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Objectives: The purpose was to describe the characteristics of the implant and the specific technical aspects and how they may affect the outcome and minimize the risk of perioperative complications.

Material and Methods: From 2019 to 2022, 58 patients with an intertrochanteric or subtrochanteric hip fracture underwent surgery by a single orthopaedic surgeon. The TRIGEN INTERTAN intramedullary nail was used for fracture fixation (short nail for the intertrochanteric and long for the subtrochanteric). The overall walking scores included the Parker mobility score. Hip functional scores included the LEFS (lower extremity function score), and HOOS (hip dysfunction and osteoarthritis outcome score). Hip joint reconstruction scores included the objective Harris hip and the subjective Oxford-12 scores. The SF-12 and EuroQol- 5D questionnaires were used to evaluate quality of life. Any postoperative (either medical or surgical) complications, hip re-fracture rate and mortality rate at 6 months and 12 months were also recorded. T – student and chi-square tests were performed using the SPSS 22.0 statistical software.

Results: There were 36 females (62%) and 22 males (38%), with a mean age of 80.9 years (range 69 to 92 years) and a mean BMI of 27.2 (range 20.5 to 32.5). Mean values of walking, hip functional, hip reconstruction and quality of life scores were progressively improved within 1 year after surgery. No major complications were recorded. There were no cases with hardware failure. The overall mortality rate at 1 year was 9.6%.

Conclusion: The TRIGEN INTERTAN nail offers a stable fixation either the short or the long device is used. Its flexibility provides an easy insertion to the bone once the correct entry point is set. The dual lag screw of the femoral neck give absolute stability and strong compression of the fracture minimizing the risk of any hardware failure.

P770

TOTAL KNEE ARTHROPLASTY WITH THE CORI ROBOTIC SYSTEM: A PROSPECTIVE STUDY

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Objectives To analyze the robotic technique with CORI and to evaluate the clinical and radiological postoperative results. **Material & Methods** 120 patients underwent total knee arthroplasty using the CORI robotic system. The pain improvement, accuracy of mechanical axis correction, range of motion, time to return to activities, and any complication were analyzed. Clinical evaluation was performed using the OXFORD KNEE score, pain was assessed with the VAS scale, and quality of life was assessed with the SF-12. Radiological evaluation consisted of plain radiographs. **Results** There were a total of 79 women (65.8%) and 41 men (34.2%), with a mean age of 71 years (range 59-83). Patients were mobilized within 6.5 hours (range 5-10 hours) after surgery and the mean hospital stay was 2 days (range 1-3 days). There was a significant improvement in pain and functional status immediately postoperatively, while the restoration of the mechanical axis was complete. No patient was transfused. Patients' overall quality of life was significantly better for both SF-12 parameters. All patients returned immediately to their homes without the need for further physical therapy. **Conclusion** CORI robotic system can provide excellent functional and clinical results even immediately postoperatively. The restoration of the mechanical axis and the kinematics of the knee is absolutely accurate, blood loss is minimal, balancing of the soft tissues is ideal and the postoperative pain is less.

P771

EXPLORING THE IMPORTANCE OF VITAMIN D SCREENING IN OLDER ADULTS WITH CHRONIC ILLNESSES: EVIDENCE FROM VLORE, ALBANIA

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Objective: Vitamin D plays a crucial role in calcium absorption, bone health, and immune function, and its deficiency can exacerbate these chronic conditions. In Vlore, as with many Mediterranean regions, exposure to sunlight is vital for Vitamin D synthesis, but lifestyle changes, limited sun exposure, and dietary patterns can affect this balance. This study aimed to evaluate the vitamin D levels in a random sample of older adults with chronic health conditions from Vlore, Albania, who were undergoing routine laboratory blood tests. The focus was on understanding the prevalence of vitamin D deficiency and its potential impact on their health.
Materials and Methods: Between March and August 2023, a total of 150 vitamin D assessments were conducted at NOVIDAL-AB, a private laboratory in Vlore. The study sample consisted of 90 women and 60 men, with participants primarily aged 65 and above. In addition to the blood tests, participants were surveyed regarding their use of vitamin D supplements and any symptoms they experienced that could be related to vitamin D deficiency.
Results: Among the 150 participants, 78 exhibited vitamin D levels below 30 ng/ml, which is considered insufficient for optimal health. The most commonly reported symptoms included muscle cramps, joint pain, and general fatigue, which are known to be associated with low vitamin D levels. The average age of participants was 65 years, and a significant majority indicated that they were not using vitamin D supplements regularly, suggesting a potential gap in preventive healthcare practices.
Conclusions: The findings indicate that a substantial portion of the older adult population in this sample has inadequate vitamin D levels, placing them at increased risk for various health complications, including weakened immune function and musculoskeletal disorders. This study underscores the urgent need for greater awareness and education on the importance of vitamin D, especially for older adults with chronic conditions, and highlights the potential benefits of routine vitamin D supplementation as part of health management for this demographic.

P772

PREVALENCE AND PREDICTORS OF SECONDARY HYPERPARATHYROIDISM AND ITS RELATIONSHIP TO BMD IN PATIENTS ATTENDING A BONE HEALTH CLINIC

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Objectives. Secondary hyperparathyroidism (SHPT) leads to bone loss, especially at cortical sites such as the hip and forearm. It can also blunt the response to antiresorptive treatment. We aimed to identify the prevalence of SHPT in patients attending our bone health clinic and examine its predictors and relationship to bone mineral density (BMD).
Materials and Methods. We identified patients from our clinic who had hyperparathyroidism (PTH>65 pg/ml). Those with serum calcium (>2.5 mmol/l) and eGFR < 30 min /ml were excluded to avoid primary hyperparathyroidism or elevated PTH due to advanced renal disease. We explored effects of vitamin D status (25(OH)D), renal function (eGFR), sex and body mass index (BMI) on SHPT in multinomial regression. We also examined for differences in lumbar and total hip BMD due to SHPT.
Results: 2298 patients identified, mean age 67.4 years, 82.7% female. Overall, 9.6% had SHPT. In a subsample (n=1911), SHPT was predicted by 25(OH)D < 30 nmol/l (OR 5.3, CI 3.6 – 7.8, p=0.0001), 25(OH)D 30 – 50nmol/l (OR 2.2, CI 1.5 – 3.3, p=0.001), GFR 30 – 60 ml/min (OR 2.6, CI 1.7 – 3.9, p=0.0001), BMI>30 (OR 3.0, CI 2.0 – 4.6, p=0.001) and older age (p=0.002). In a subsample (n=1677), BMD at the hip was lower (0.735 vs 0.765 g/cm, p=0.012) in those with versus without SHPT but there was no difference at the spine.

Conclusion. One in ten patients had SHPT which was associated with lower hip BMD (-3.9%). The biggest predictor was vitamin D deficiency with 25(OH)D (30 – 50 nmol/l) also doubling the risk. Other independent predictors were eGFR 30 – 60 ml/min, obesity, and older age. Similar predictors of SHPT have been found in other studies. The mechanism of the relationship between higher PTH and obesity remains unclear. Findings highlight the importance of maintaining adequate vitamin D levels to prevent SHPT and bone loss at the hip.

P773

THE OBESITY PARADOX – AN INCREASED RISK OF VERTEBRAL AND ANKLE FRACTURES IN OBESITY

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Objectives. Higher body mass index (BMI) is associated with greater bone mineral density (BMD) though the relationship between BMI and non-hip fracture risk is complex. We aimed to investigate the association between BMI and vertebral and ankle fractures in patients at our bone health clinic.
Materials and Methods. Patients identified from our clinic database. The association between vertebral and ankle fractures and BMI was explored in multinomial regression adjusting for age, sex and then lumbar spine or hip BMD. BMI (kg/m^2) was categorised as low (<18.5), normal (18.5 – 24.9), overweight (25 – 29.9) and obese (>30.0) with the reference group being normal.
Results. There were a total of 4813 and 787 patients in the respective vertebral and ankle fracture groups for which data was available. An increased risk of vertebral fracture (OR 1.37, CI 1.16 – 1.63, p<0.001) was found in those who were obese. In a subsample (n=4546) the risk remained after adjusting for lumbar spine BMD (OR 1.57, CI 1.30 – 1.80, p<0.001). There was also an increased risk of ankle fracture in obesity (OR 2.61, CI 1.57 – 4.34, p<0.001) which remained in a subsample (n=666) after adjusting for total hip BMD (OR 2.52, CI 1.46 – 4.38, p=0.001).
Discussion. Obesity irrespective of BMD was associated with an increased risk of fracture at the ankle (2.5 times higher) and vertebrae (57% higher) as reported elsewhere. Altered gait and greater ankle impact on falling in obese adults may explain this. Higher vertebral fracture risk in obesity may be due to greater loading forces on the spine, deterioration in vertebral micro-architecture and increased bone marrow fat content.

P774

HIGH PREVALENCE OF OSTEOPOROSIS AND SARCOPENIA IN PATIENTS UNDERGOING KNEE ARTHROPLASTY

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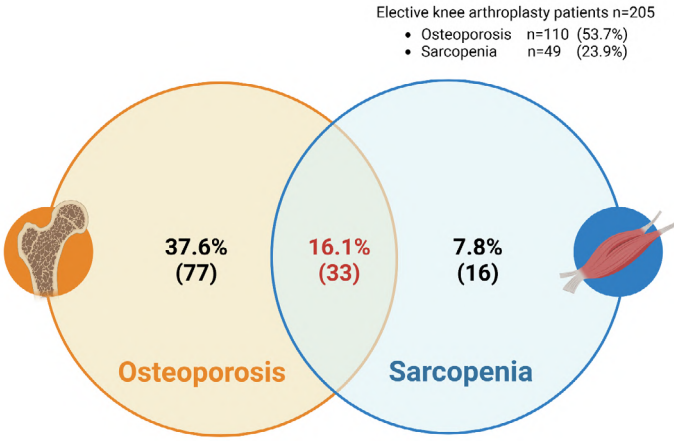
Objective: With the global shift toward an aging population, age-related conditions such as osteoporosis, sarcopenia, and osteoarthritis are becoming increasingly prevalent. In patients undergoing knee arthroplasty (KA), osteoporosis has been shown to increase the risk of periprosthetic fractures, while sarcopenia is associated with a higher incidence of postoperative medical complications and blood transfusion. Despite their clinical importance, data on the prevalence of these conditions in KA patients remain limited. We aimed to determine the prevalence of osteoporosis, sarcopenia, and osteosarcopneia in patients undergoing KA.
Material & Methods: This cross-sectional study enrolled patients who underwent elective primary total knee arthroplasty and unicompartmental knee arthroplasty at a single tertiary care hospital. Risk factors and previous treatment for osteoporosis were collected. All patients were evaluated for 25-hydroxyvitamin D level, bone mineral density, skeletal muscle mass, grip strength, and the 5-time Chair Stand test. Osteoporosis and sarcopenia were diagnosed according to the World Health Organization definition and the Asian Working Group for Sarcopenia 2019 criteria, respectively.
Results: A total of 205 patients were included (mean age 70.2 ± 7.9 years; 86.3% female). The prevalence of osteoporosis, sarcopenia, and osteosarcopenia was 53.7%, 23.9%, and 16.1%, respectively. Notably, only 22.7% of subjects with osteoporosis had received anti-osteoporosis medication prior to surgery, and less than half of KA patients (41.5%) had received calcium and vitamin D supplementation. Additionally, one-third of patients (36.6%) were found to have vitamin D deficiency (<20ng/ml).
Conclusions: There is a high prevalence of osteoporosis and sarcopenia in patients with advanced knee osteoarthritis undergoing KA, with 16% of these patients diagnosed with osteosarcopenia. However, the treatment rate remains surprisingly low; less than a quarter of the indicated patients received osteoporosis medication before the surgery. Considering the increasing number of KA globally, it is essential to integrate comprehensive assessments of bone and muscle health into the preoperative evaluation process. Early diagnosis, timely treatment, and preoperative optimization for osteoporosis and sarcopenia should be prioritized to improve surgical outcomes and long-term musculoskeletal health in this aging population.



P775

THE EFFECT OF INITIAL AND SUBSEQUENT DENOSUMAB OR ZOLEDRONATE APPLICATIONS ON BIOCHEMICAL PARAMETERS IN PATIENTS WITH PRIMARY HYPERPARATHYROIDISM

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Objective: The reduction in serum calcium (S-Ca) after the initial dose of denosumab is greater compared to subsequent doses in patients with GFR of < 30 ml/min/1.73m^2 and osteoporosis. We investigated if antiresorptive therapy had a similar time-related effect on S-Ca and other biochemical parameters in patients with primary hyperparathyroidism (PHPT) and GFR of > 30 ml/min/1.73m^2.

Methods: We analyzed data from our ongoing randomized trial on osteoporotic postmenopausal women with PHPT who are being treated with either denosumab 60 mg sc every six months (DMAB group) or with zoledronate 5 mg iv once a year (ZOL group) (ClinicalTrials.gov Identifier NCT04085419). Here, we compare S-Ca, intact parathyroid hormone (iPTH), and bone turnover markers following initial and subsequent zoledronate or denosumab application.

Results: We enrolled 40 females with PHPT and osteoporosis (aged 73.0 (7.8 SD) years; 22.6 (10.0) years from menopause; BMI 27.77 (5.1) kg/m^2; GFR 91.7 (25.7) ml/min/1.73m^2). After randomization, 20 women received denosumab (DMAB group) and 20 zoledronate (ZOL group). The changes in S-Ca at six months (6M) intervals in DMAB group were insignificant after initial and after subsequent applications. 6M after the first zoledronate application, S-Ca was significantly lower (ZOL Δ S-Ca 6M -0.06 (0.09); p=0.014 mmol/L), but it remained unchanged 6M after the second application. An iPTH level increased significantly in both groups at 6M (DMAB Δ iPTH 6M 31.84 (100.29); p=0.009, ZOL Δ iPTH 6M 36.39 (43.02); p=0.015 ng/L), but it decreased insignificantly after subsequent applications. Bone turnover markers decreased significantly at 6M in both groups (DMAB Δ CTX 6M -0.77 (0.407); p<0.001; ZOL Δ CTX 6M -0.534 (0.429); p<0.001 µg/L; DMAB Δ P1NP 6M -64.03 (30.39); p<0.001; ZOL Δ P1NP 6M -49.06 (27.88); p<0.001 µg/L; DMAB Δ BAP 6M -18.15 (8.72); p<0.001; ZOL Δ BAP 6M -13.02 (6.8)p<0.001 µg/L), but remained low and unchanged thereafter.

Conclusion: In our cohort of postmenopausal females with PHPT and osteoporosis, the initial application of either denosumab or zoledronate had a greater effect on serum calcium and other bone-related biochemical parameters than subsequent applications.

P776

FILLING GAPS IN TELEREHABILITATION: VALIDATING REMOTE SYNCHRONOUS AND ASYNCHRONOUS ASSESSMENTS OF PERFORMANCE-BASED OUTCOMES

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Objective: This study assessed the agreement between three methods of performance-based outcome data collection for the 4-Meter Walk (4MW), Timed Up and Go (TUG), and Five-Repetition Sit-to-Stand (5XSTS) tests.

Materials and Methods: Fifty-eight participants were randomized into six groups, completing assessments in different sequences for in-person, remote synchronous, and remote asynchronous assessments of the 4MW, TUG and 5XSTS. In-person assessments served as the gold standard and were repeated five times to capture natural variability of the assessment; remote assessments were performed twice. Participants self-timed remote assessments. Participants were supervised in the remote synchronous assessment and were unsupervised during the remote asynchronous assessment. Agreement was analyzed using the extended Bland-Altman method accounting for repeated measurements, with limits of agreement (LOA) calculated as the mean difference ± 1.96 standard deviations.

Results: Participants were on average 40 years old (range 19–86), confident using technology (97%), held at least a bachelor's degree (83%), managed a medical condition (40%), and managed at least one active pain complaint (12%). After excluding three statistical outliers, remote synchronous and asynchronous assessments agreed with in-person assessments across all outcomes, with no significant differences in timing. Including outliers, agreement was observed only for the 4MW. Asynchronous TUG demonstrated the largest mean bias (3.31 seconds, 95% CI [2.62, 4.01]). Agreement diminished for tasks requiring more time to complete. Notably, the three outliers were among the study's oldest participants.

Conclusion: Telerehabilitation is a viable management approach. This study shows that in-person, remote synchronous, and asynchronous methods of assessing performance-based outcomes are interchangeable for most participants but require further vali-

dation among older adults. This may have reflected the dual-task nature of the remote assessments. Our findings support the use of select performance-based assessments in virtual environments among most participants studied. This research addresses critical gaps in remote physical performance assessment as health providers transition to greater use of telehealth.

P777

PHOTOTHERAPY WITH POLARIZED POLYCHROMATIC LIGHT IN THE TREATMENT OF ODONTOGENIC PERIOSTITIS

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Objective: To increase the effectiveness of the treatment of odontogenic periostitis by including phototherapy with polychromatic polarized light in the complex of local treatment.
Methods: We observed 40 patients with acute purulent odontogenic periostitis, who were divided into two groups: the main and the control (20 people each). All patients underwent periosteotomy using the standard technique with and without removal of the causative tooth, and were prescribed generally accepted general therapy. In the control group, after periosteotomy, the wound was washed daily with an aqueous solution of antiseptic. UHF currents were used as a physiotherapeutic agent. In the main group, after opening the subperiosteal abscess, the wound was also sanitized with a chlorhexidine solution, followed by applying a Sanguiritin dressing for 15 minutes, after which Emalan gel was applied to the postoperative wound. In addition, in the main group, local exposure procedures were performed with a Bioptron lamp using polychromatic polarized light. The polarized light beam was used externally in the projection of the wound, directing it at an angle of 90 ° to the skin surface at a distance of 3-5 cm, the exposure time was 6 minutes, 8 procedures, daily.
Results: Clinical observations have shown that, it was found that the intensity of recovery processes in the wound was higher in patients in the main group, the severity of general and local inflammatory reactions decreased faster, early cleansing of the postoperative wound from purulent-necrotic contents was noted, treatment times were reduced, and the risk of developing local complications of an infectious and inflammatory nature was reduced.
Conclusion: With local exposure to polychromatic polarized light of the Bioptron lamp, in the complex treatment of patients with acute purulent odontogenic periostitis, which has a local anti-inflammatory, anti-edematous, anesthetic, reparative-regenerative effect, contributes to a more rapid subsidence of inflammation symptoms, activation of regenerative reactions, reduction of the treatment time of patients, which allows using this method in surgical dental practice, both for treatment and for the prevention of postoperative complications of an infectious-inflammatory nature.

P778

XENOGENIC TRANSPLANT OSTEOBIOL DERMA IN SINGLE-STAGE IMPLANTATION AND AUGMENTATION OF SOFT TISSUES AFTER TOOTH EXTRACTION

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Objective: Purpose. To evaluate the effectiveness of the xenogeneic transplant Osteobiol Derma for soft tissue augmentation with one-stage implantation based on clinical, cytological and radiological examination methods.
Methods: We examined 10 patients aged 30 to 50 years, of both sexes, with defects in dental arches, without somatic pathology. The one-stage dental implantation operation was performed under local anesthesia. The tooth was removed, maximally preserving the inter-root septum, bone walls and alveolar bottom. The implants were installed according to the protocol for the introduction of a one-stage surgical intervention. To replace the bone spaces between the socket wall and the implant, the bone plastic material Gen-os osteobiol was placed. A resorbable xenogeneic membrane Osteobiol Derma was placed over the introduced bone material and the installed implant, under the soft tissue flap, and fixed with guide sutures.
Results: The postoperative period was uneventful. The clinical and cytological data indicate the intensity of reparative processes in the wound. According to the X-ray examination, after 3 months the bone defect was mostly formed by newly formed bone tissue that had undergone maturation. The resorption of the preparation occurred gradually, the restoration of the bone tissue defect was of the type of complete healing. All this made it possible to obtain good preservation and stabilization of the transplant in full and led to successful rehabilitation of the implant.
Conclusion: The use of the resorbable xenogeneic membrane Osteobiol Derma in one-stage implantation is an effective method for stabilizing the protection of the bone transplant, as well as a support for the growth of epithelial tissue, which does not require removal. Atraumatic execution, high biocompatibility, gradual resorption and vascularization, in turn, are key factors in clinical success and a good aesthetic result and allow us to recommend the use of this method in wide clinical practice.

P779

ON THE ISSUE OF INCREASING THE EFFECTIVENESS OF TREATMENT OF TRAUMATIC OSTEOMYELITIS OF THE MANDIBLE

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Objective: To increase the effectiveness of treatment of patients with traumatic osteomyelitis of the mandible by including Bestim in the treatment complex.
Methods: A total of 58 patients with traumatic osteomyelitis of the lower jaw were examined and treated. All patients were divided into 2 groups: control (27 people) and main (29). All patients with traumatic osteomyelitis of the lower jaw received traditional complex treatment, according to indications they were given immobilization of the lower jaw and traditional drug postoperative therapy. In the main group, in addition to traditional therapeutic treatment, patients received Bestim (intramuscularly, once a day, No. 5-7).
Results: All patients with traumatic osteomyelitis of the lower jaw before the start of treatment had clinical and radiological signs characteristic of a purulent-destructive post-traumatic process that developed in the mandibular bone. Significant changes were demonstrated by the general immunity indicators: IgA decreased by 39% ($p < 0.01$), and IgM by 24.7% ($p < 0.05$), which indicated the presence of disorders in the general immunity system. These results also indicated the presence of moderate initial local and general inflammatory reactions, metabolic hypoxia and chronic immunodeficiency in patients. The dynamics of the restoration of immunogram indicators was of particular importance for us, since it allowed us to judge the level of effectiveness of sequestrectomy and the quality of elimination of secondary immunodeficiency developing in patients with traumatic osteomyelitis of the lower jaw. In the main group, normalization of IgM, IgG indicators was recorded on the 10th day of therapy, and IgA - on the 21st day of therapy. In the control group, the restoration of the digital values of the studied indicators was recorded at a later date.
Conclusion: The inclusion of an immunomodulator and antioxidant in the treatment complex for patients with traumatic osteomyelitis of the lower jaw significantly increases its effectiveness. This is evidenced by earlier periods of restoration of immunological parameters of the blood (on the 7th-14th day, in the control - on the 14th-21st), a decrease in the number of local complications (by 28.4%) and relapses of the disease (by 7.7%).

P780

EFFECTIVENESS OF COLLAGEN D6 PHONOPHORESIS IN REHABILITATION OF CHILDREN WITH TEMPOROMANDIBULAR JOINT DYSFUNCTIONS

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Objective: To conduct a study of the effectiveness of including phonophoresis with the medicinal gel collagen D6 c Gel THERAPY (GUNA, Italy) in the rehabilitation complex of patients with distension diseases of the TMJ.
Methods: We examined and treated 30 children aged 16-18 years with distension diseases of the TMJ, of which 20 patients received a rehabilitation complex: a sparing unloading diet, jellied dishes, jelly, cheeses, seafood, enriched with vitamins E, B, C, Mg; therapeutic physical training, postisomeric relaxation; massage of the collar zone; Phonophoresis of D6 collagen with a therapeutic gel in the area of both TMJs using the technique we developed. Phonophoresis technique of D6 collagen with Gel THERAPY: the medicinal mixture of D6 with Gel THERAPY was applied to the skin in the area of the TMJ, including adjacent tissues and the projection of the masticatory muscles. The effect was achieved with a 1 cm2 emitter, frequency of 880 kHz, intensity of 0.4 W/cm2, pulsed 10 ms or continuous mode. The duration of exposure to the joint was 3 minutes, the course of treatment consisted of 12 daily procedures. The control group consisted of 10 patients similar in gender, age, and clinical data. Their rehabilitation complex included ultrasound using the same technique instead of phonophoresis of D6 collagen, the contact medium being lanolin oil.
Results: After the treatment, patients in both groups noted the disappearance or significant reduction of pain during exercise. Limited joint mobility was noted by only 1 /10%/ patient in the control group. Joint instability was noted by 1 patient in the main group and 3 patients in the control group. The "click" symptom persisted in 2 patients in the main group and 4 in the control group. The study of the results of the study using the TMJ Assessment Scale showed that the improvement in patients in the main group after collagen phonophoresis was manifested not only by the disappearance of pain, but also by improved joint function and decreased instability; the score was 9.5±1.49, ($P<0.001$). The result in patients in the control group after treatment was 12.4±2.35 ($P>0.2$).
Conclusion: The study showed a positive effect of D6 collagen phonophoresis with Gel THERAPY on the main pathogenetic links of distension diseases of the temporomandibular joint.

P781

REGIONAL HEMODYNAMICS IN PATIENTS WITH LOWER JAW FRACTURES USING PHYSIOPHARMACOTHERAPY

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Objective: Study the recovery period in patients with lower jaw fractures and the effect of bioresonance therapy and a combination of bioresonance therapy and Osteogenon on the fracture consolidation process and regional hemodynamics in the fracture zone.

Methods: We observed 120 male patients with lower jaw fractures, aged 18 to 58 years. The patients were divided into 3 groups, with 40 people in each group.

All patients first underwent splinting of bone fragments with a splint-bracket with hook loops according to Tigerstedt method. The teeth were set in the bite and fixed with rubber traction.

Bioresonance therapy was carried out according to the following method: on the 2nd day, the BRS device was applied to the collar zone according to the standard method. For the effect, nozzle No. 3 was used, mode 1, the exposure time was from 3 to 5 minutes, the duration at each position was 10-30 seconds, for 3-4 days. From the 5th day, not only the collar zone was affected, but also the area of the projection of the fracture of the lower jaw through the skin. Gradually, the force (mode 3) and the exposure time (up to 12 minutes) were increased, the course of treatment was 10 procedures.

Osteogenon (ossein-hydroxyapatite complex), used mainly for the prevention and treatment of systemic osteoporosis. The course of treatment with the drug is 2 tablets 2 times a day for 14 days.

In group III, treatment was carried out according to the generally accepted method (splinting, anti-inflammatory therapy, e.p. UHF).

The treatment efficiency was assessed based on clinical and morphological data and the results of the functional examination method (rheography) after immobilization and 2 weeks after the start of treatment. Rheograms were assessed based on 11 main parameters, taking into account arterial and venous circulation. The rheography data of 15 healthy people aged 16 to 60 years served as a control. Electrodes were applied according to the method of N.B. Laskova (Laskova N.B., 1973) bipolarly. Rheographic curves were subjected to qualitative and quantitative analysis with subsequent mathematical processing according to Student.

Results: Upon admission, patients in all 3 groups had edema and swelling of soft tissues due to trauma, and a combination of edema and hematomas. Almost all patients had displacement of bone fragments of the lower jaw. Impaired regional circulation was noted for all main indicators in 89% of patients. There was a decrease in the rheographic index, relative volumetric pulse, an increase in the relative β index, a decrease in the catacrotic angle, which indicated a violation of both arterial and venous blood flow.

Later, after the treatment, in patients of groups I and II, who were simultaneously treated with bioresonance stimulation and a complex of bioresonance stimulation and Osteogenon, traumatic edema and hematomas decreased and disappeared earlier than in patients of group III.

Conclusion: Thus, complex treatment of mandibular fractures with the inclusion of bioresonance therapy and Osteogenon contributes to earlier fusion of mandibular fragments, restoration of working capacity and functional indicators.

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APPLICATION OF BIORESONANCE THERAPY IN LOWER JAW FRACTURES

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Objective: According to the standpoint of rheographic indices of local blood flow, to assess the effect of BRT on local blood flow and the rate of bone regeneration in patients with lower jaw fractures based on radiographic data, as well as the nature and number of inflammatory complications.

The aim of this study is to substantiate the possibility of stimulating osteogenesis and the development of inflammatory phenomena by the effect of bioresonance therapy (BRT) and sorbent tissue in the complex treatment of patients with lower jaw fractures.

Methods: The method for conducting bioresonance therapy for a lower jaw fracture was as follows: after fixation of the bone fragments of the lower jaw with a metal splint, a bracket with Tigerstedt hook loops. On the second day of treatment, the collar zone was exposed to the BRT device using the standard technique. Mode "3" was used for the exposure, the exposure time was from 3 to 5 minutes. The duration at each position was 10-30 seconds. The same exposure was carried out on days 3 and 4. From the 5th day, not only the collar zone was affected, but also the fracture area through the skin. Gradually increasing (mode "3") the force and time of exposure (up to 12 minutes).

Results: During bioresonance therapy, we did not observe any complications in patients. The formation of primary bone callus was observed radiologically on the 6-7th day after the fracture. Clinical consolidation of the fracture was observed on the 24th day. After the bioresonance therapy session, the patients underwent a rheographic study of the perimaxillary soft tissues. An increase in hemodynamics was observed in the fracture zone, which accordingly has a positive effect on the rate of formation of primary bone callus and clinical consolidation of the fracture of the lower jaw. We did not encounter any inflammatory complications when using bioresonance therapy.

Conclusion: Increased local hemodynamics has a positive effect on the course of formation of primary bone callus, accelerates its formation, which accordingly leads to earlier clinical consolidation of the fracture, and prevents the occurrence of inflammatory complications.

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EFFECTIVENESS OF PHYSIOTHERAPY AND PHARMACOTHERAPY IN TREATMENT OF LOWER JAW FRACTURES

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Objective: The aim of this work was to study the structural and functional state of bone tissue in patients with lower jaw fractures and the effect of bioresonance therapy and a complex of bioresonance therapy and Osteogenon on the process of fracture consolidation and bone tissue remodeling processes.
Methods: 80 male patients with lower jaw fractures, aged from 18 to 58 years are observed. All patients first underwent splinting of bone fragments with a splint-bracket with hook loops according to Tigerstedt. Bioresonance therapy was carried out according to the following technique: on the 2nd day, the collar zone was exposed to the BRS device according to the standard technique. The force (mode 3) and exposure time were gradually increased; the treatment course was 10 procedures. Osteogenon (ossein-hydroxyapatite complex), used mainly for the prevention and treatment of systemic osteoporosis. The course of treatment with the drug is 2 tablets 2 times a day for 14 days. In group III, treatment was carried out according to the generally accepted method. The study of the structural and functional properties of bone tissue was studied using an “Achilles+” ultrasound densitometer, which recorded the following parameters: broadband ultrasound attenuation, ultrasound propagation velocity, bone density index.
Results: A study of the initial data on the structural and functional properties of bone tissue in patients with a mandible fracture revealed that 40 (50%) of them had osteopenic syndrome, manifested in a decrease in the level of SRU, SHOU and IP. These changes had a high degree of reliability, compared with the norm. After the treatment, densitometric indices in patients of groups I and II increased significantly, most pronounced in patients of group II, who were simultaneously treated with bioresonance stimulation and osteogenon. In patients of group III, the parameters under study remained within the normal range, but tended to decrease. structural and functional properties of bone tissue were more pronounced in group II. Thus, we noted the greatest therapeutic effect in the group of patients with osteopenic syndrome, who underwent combined treatment with bioresonance stimulation causing intensification of microcirculation and metabolic processes in the tissues of the mandibular region, and osteogenon having a dual effect on bone tissue metabolism: a stimulating effect on osteoblasts and an inhibitory effect on osteoclasts, which is accompanied by an increase in calcium absorption.
Conclusion: The use of bioresonance stimulation helps to improve the structural and functional properties of bone tissue and mineral metabolism. The greatest effect on the restoration of the structural and functional properties of bone tissue is achieved by the combined use of bioresonance stimulation and Osteogenon.

P784

ASSESSMENT OF FACTORS ASSOCIATED WITH LOW MUSCLE MASS IN WOMEN WITH RHEUMATOID ARTHRITIS

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Objective: Purpose of the study is determining the incidence of sarcopenia (SP) and factors associated with low muscle mass in a cohort of women with rheumatoid arthritis (RA).
Methods: 87 women aged 40-75 years with confirmed RA underwent dual-energy X-ray absorptiometry of the lumbar spine, proximal femur, and whole body to determine bone mineral density (BMD) in standard areas and to quantify muscle mass. The appendicular muscle mass (AMM) was determined as the sum of the muscle mass of the arms and legs, and the appendicular muscular index (AMI) was determined as the ratio of AMM to the square of the height, with AMM<15 kg and/or AMI<6 kg/m^2 considered criteria for decreased muscle mass. Muscle strength was assessed using hand dynamometry and the "Stand up from a chair" test. The functional state of the muscles was determined by the walking speed at 4 m, the "Stand up and go" test and the total score of the short set of physical fitness tests (SAT OFF). AP was diagnosed according to the criteria of the European Working Group on Sarcopenia in Older People (EGGSOP2, 2018). Based on the correlation analysis, the associations between muscle mass and clinical, anamnestic and laboratory data were studied.
Results: Probable spondylosis (based on decreased muscle strength) was found in 80 (92%) of the examined women. Demonstrable spondylosis (decreased muscle strength in combination with low AMM and/or AMI) was detected in 20 (23%) patients, with 9 (10%) of them having decreased functional state of muscles, which allowed diagnosing severe spondylosis in these women. Comparative analysis showed that patients with RA and demonstrable spondylosis, compared with women without spondylosis, had a longer duration of RA (p=0.006), lower BMI (p=0.0001), more often took glucocorticoids (p=0.04), and had lower BMD in the femoral neck and proximal femur as a whole (p=0.049 and p=0.009, respectively).
Conclusion: According to the results of correlation analysis between AMM, AMI, and clinical laboratory data, which revealed that AMM directly correlated with BMI (r=0.58), methotrexate dose (r=0.26), serum uric acid and creatinine concentrations (r=0.56 and r=0.33, respectively), BMD in all measurement areas (r from 0.36 to 0.5), and inversely correlated with the cumulative dose of glucocorticoids. In addition to the above parameters, AMI also inversely correlated with the duration of RA (r=-0.32) and the number of falls in the previous year (r=-0.24).

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ANALYSIS OF THE FREQUENCY OF SEROLOGICAL MARKERS TO THE CAGA HELICOBACTER PYLORI ANTIGEN IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS

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Objective: Numerous epidemiological and clinical studies conducted in various regions and countries of the world indicate an extremely wide and widespread distribution of Helicobacter pylori in the human population. It should be taken into account that the incidence of Helicobacter infection throughout the world is not decreasing and remains at a fairly high level. The reason for this is the epidemiological features of the infection – a relatively high probability of contracting Helicobacter pylori in childhood in the family, during invasive research methods in healthcare institutions, late diagnosis of the disease, etc. To date, it has been established that infection with bacteria leads to a variety of clinical manifestations. Helicobacter pylori causes not only the development of gastritis and peptic ulcer disease, but can also be accompanied by extragastric manifestations. In particular, helicobacteriosis can contribute to the development of osteoporosis. Thus, the aim of this study was to study the frequency of registration of total antibodies to the CagA antigen of Helicobacter pylori in women with postmenopausal osteoporosis.

Methods: 520 postmenopausal women were examined. The indicators of the age of the examined patients were 62 years, and the duration of the postmenopausal period was 13 years. The studies included osteodensitometry (DEXA method) and blood serum testing for specific class M antibodies and total antibodies (IgA, IgM, IgG) to the CagA Helicobacter pylori antigen (enzyme-linked immunosorbent assay) in all patients.

Results: It was found that in the group of women with postmenopausal osteoporosis (n=151), positive serological tests for total antibodies to the CagA Helicobacter pylori antigen were recorded in 29.1% of cases. The frequency of detection of the above-mentioned specific antibodies in the group of women with osteoporosis significantly (p=0.049) exceeded the similar indicator established in the combined group of healthy women and patients with osteopenia (20.6%). The frequency of positive tests for class M antibodies to the CagA antigen of Helicobacter pylori (4.8%) did not show an association with the state of bone tissue in postmenopausal women (p=0.951).

Conclusion: The studies conducted have established an increased frequency of Helicobacter pylori infection in women with postmenopausal osteoporosis compared to individuals characterized by either normal bone tissue or osteopenia (p=0.049). The obtained results require clarification in further studies.

P786

PREOPERATIVE MUSCLE MASS AFFECTS PREOPERATIVE LOW BACK PAIN SCORE AND IMPROVEMENT OF SCIATICA IN PATIENTS WITH LUMBAR CANAL STENOSIS

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Introduction: LSS causes lower back pain, lower extremity pain and numbness, lower muscle weakness, and gait disturbance, resulting in decreased physical function. Only a few studies have evaluated the relationship between muscle mass and the outcome of LSS surgery.

Aim: The aim of this study was to investigate the relationship between preoperative muscle mass and clinical outcomes in patients with LSS who underwent surgical treatment.

Materials and Methods: A total of 86 patients were included in the current study. We evaluated skeletal muscle mass using bioelectrical impedance analysis and calculated the skeletal muscle mass index (SMI), corrected by the square of height. The following indices were measured before and 3 weeks after each operation: Visual analogue scale (VAS) scores for lower back pain, lower extremity pain, and lower extremity numbness. The recovery rate for each score following surgery was also evaluated. In order to assess the impact of muscle mass on the clinical score of LSS surgery, the patients were divided into two groups (sarcopenia group and non-sarcopenia group).

Results: The pre-operative VAS score for lower back pain was significantly higher in the sarcopenia group compared with the non-sarcopenia group ($p<0.05$). Although there was no statistical difference in the VAS score for lower extremity pain before surgery between the two groups, the recovery rate in this score was significantly higher in the non-sarcopenia group ($p <0.05$).

Conclusion: This study showed that some preoperative low back pain scores were worse in the sarcopenia group compared with those in the non-sarcopenia group. In addition, there was less improvement in lower extremity pain following surgery in the sarcopenia group compared with the non-sarcopenia group. These findings indicated that preoperative muscle mass may affect preoperative low back pain score and the improvement in sciatica in patients with lumbar canal stenosis. The preoperative physical therapy for low muscle mass might be effective for LSS surgery.

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BIOCHEMICAL AND PATIENT-REPORTED OUTCOMES IN PATIENTS WITH TUMOUR-INDUCED OSTEOMALACIA TREATED AND NOT TREATED WITH BUROSUMAB

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Objectives: Tumour-induced osteomalacia (TIO) is an ultra-rare condition caused by tumours secreting fibroblast growth factor 23 (FGF23), resulting in chronic hypophosphataemia, and consequent severe musculoskeletal morbidities, pain, fatigue, and impaired physical function. Burosumab, a fully human monoclonal antibody which targets FGF23, is indicated for treatment of TIO where tumours cannot be localised or curatively resected. This study aimed to compare biochemical and patient-reported outcomes (PROs) in patients with TIO treated and not treated with burosumab in a real-world setting.

Methods: The TIO Disease Monitoring Program (DMP, NCT04783428) is a 10-year prospective, multicentre, observational study enrolling patients with TIO across the US and Latin America. This is a descriptive study of biochemical outcomes and PROs assessed at the time of DMP enrolment (baseline), stratified according to burosumab treatment status at enrolment.

Results: Of the 21 patients with TIO enrolled, 11 (52.4%) were treated with burosumab at baseline, for a median (IQR) duration of 4.1 (6.2) years. Burosumab-treated patients had higher median serum phosphorus, lower alkaline phosphatase and higher $1,25(OH)_2D$ levels compared to those not treated with burosumab. Median Brief Pain Inventory Short Form (BPI-SF) and Brief Fatigue Inventory Short Form (BFI-SF) worst scores were lower in the burosumab-treated group, indicating lower symptom severity, while median PROMIS Physical Function (PROMIS-PF) and Short-Form Six-Dimension (SF-6D) scores were higher, indicating better functioning and health-related quality of life.

Table 1. Patient characteristics, biochemistry and PROs.

Characteristic	Burosumab at enrolment (n=11)	No burosumab at enrolment (n=10)
Age (years)*	54.2 (12.5)	45.2 (26.9)
Male **	5.0 (45.5)	3.0 (30.0)
Time since diagnosis (years)*	8.6 (14.5)	1.1 (4.2)
Serum phosphorus (mg/dL) *	3.5 (1.4)	1.9 (1.5)
ALP (U/L) *	105.0 (58.0)	156.0 (156.0)
$1,25(OH)_2D$ (pg/ml) *	55.4 (70.0)	28.7 (28.8)
BPI-SF (worst) *	4.0 (4.0)	7.5 (3.5)
BFI-SF (worst) *	3.0 (5.0)	4.0 (5.7)
PROMIS-PF*	41.4 (11.5)	38.9 (11.9)
SF-6D*	0.68 (0.18)	0.64 (0.22)

** Median(IQR); ** N(%)*

Conclusion(s): At the time of enrolment, the TIO DMP shows favourable biochemical outcomes and PROs in TIO patients treated with burosumab versus those not treated with burosumab.

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CALCIUM AND VITAMIN D INTAKE IN RELATION TO OSTEOPENIA AND OSTEOPOROSIS RISK IN PATIENTS WITH CELIAC DISEASE

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Objective: One of the most common complications of celiac disease (CD) is a low bone mineral density (BMD) which is due to several factors, including impaired absorption of calcium (Ca) and vitamin D (vit. D). This study aimed to find association between BMD and dietary intake of Ca and vit. D in CD patients.

Materials and Methods: A total of 60 participants under 50 years of age were recruited from the outpatient clinic with 40 people with CD following gluten-free diet (GFD) and 20 people following traditional diet in the control group (CG). BMD, T-score, and Z-score of the lumbar spine (L1-L4) and femoral neck (FN) were assessed using the Lunar DPX-Plus device (Lunar Inc., Madison, WI, USA). Participants were asked to follow their usual diet to assess intakes of Ca and vit. D by 4-day food records analysed (Diet 6.0, Poland). The percentage coverage of recommended intakes (RDA) between the two groups and differences in BMD in the groups with RDA<100% and RDA>100% were assessed. Blood samples were collected. Finally, an appropriate statistical analysis was carried out.

Results: CD patients presented lower BMD, T-score, and Z-score at the FN and L1-L4 than CG. No differences in Ca (769.13 vs. 884.52 mg/d) and vit. D (2.28 vs. 3.06 mg/d) intakes were ob-

served between CD patients and CG. However, participants in both groups did not meet the RDA for Ca (77.84 vs. 88.85% RDA) and vit. D (17.35 vs. 20.42% RDA). Patients not meeting RDA of Ca had differences in body mass (60.46 vs. 67.5 kg), FN BMD (0.98 vs. 1.08), and FN T-score (-0.43 vs. 0.32) between CD patients and CG, but no differences were observed in the group meeting RDA of Ca. None of participants met RDA for vit. D but patients with CD had higher vit. D concentrations than CG (41.51 vs. 28.88 ng/dl), whereas no differences were observed in Ca (5.11 vs. 5.29 mg/dl).

Conclusions: CD patients have high risk of low BMD and their diet is deficient in Ca and vit. D. Given the direct involvement of Ca and vit. D in bone metabolism, it is imperative to emphasise the importance of dietary Ca intake and vit. D supplementation in patients with CD. The elevated vit. D concentrations observed in patients with CD may be attributed to the fact that CD patients were under outpatient care at our clinic, where the supplementation of vit. D and, if necessary, Ca is recommended.

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Therrien A. et al. J Clin Gastroenterol. 2020
Lungaro L. Nutrients 2023

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ASSOCIATION BETWEEN BODY COMPOSITION PARAMETERS AND BONE MINERAL DENSITY IN PATIENTS WITH CELIAC DISEASE

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Introduction: Celiac disease (CD) has been linked with increased susceptibility to osteoporosis; therefore, the aim of the study was to explore association between body composition parameters and bone mineral density (BMD) in a group of patients with CD.

Methods: This study covered 76 participants: 56 adults—47 women and 9 men—mean age 39 years, and 20 healthy controls—16 women and 4 men, mean age 38 years recruited from the outpatient clinic. Densitometry of the lumbar spine (L1–L4) and femoral neck (FN) was conducted with Lunar DPX-Plus device (Lunar Inc., Madison, WI, USA). Body composition was measured by bioimpedance analysis (BIA) method (TANITA MC-980 MA, Tanita, Tokyo, Japan) to the nearest 0.01 kg. Finally, appropriate statistical analysis was carried out.

Results: CD patients presented lower BMD, T-score, and Z-score at the FN and L1-L4 than CG. We found osteopenia in the FN in 19.65% of patients and in L1–L4 in 26.79% of the patients. One patient displayed evidence of osteoporosis in the L1–L4 region, while two patients (3.57%) exhibited similar findings in the FN. There were no significant differences between body mass, fat-free mass (FFM), muscle mass, % of fat mass, basal metabolic rate (BMR), and body mass index (BMI) between CD patients and CG. Significant positive correlations were observed between BMD and body mass, FFM, muscle mass, and BMR for both L1–L4 and the FN, and BMI and BMD of the L1–L4. There was no relationship between BMD and % of fat mass in either group.

Conclusions: In conclusion, despite a higher incidence of osteopenia and osteoporosis in CD patients, there are no significant differences in body composition between the two groups, but participants with lower body weight, FFM, muscle mass, and BMR were more likely to have a reduced BMD what can be explained by the direct mechanical stimulation of bone by muscle, which promotes osteogenesis. Since there were no correlations between BMD and % of fat mass, we suppose that adipose tissue may have a negative impact on BMD if present in excess due to the possible low-grade inflammation generated. It seems worthwhile to explore the possibility of body composition testing with BIA as a potential indicator of increased risk of bone disease in the CD population.

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Disclosures: None Disclosed.

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DOES COEXISTENCE OF CELIAC DISEASE WITH TYPE 1 DIABETES AND INFLAMMATORY BOWEL DISEASE INCREASE THE RISK OF LOW BONE MINERAL DENSITY?

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Objective: Autoimmune diseases are more frequently observed in celiac disease (CD) than in the healthy population. Taking this into account, the aim of this study was to assess whether patients who in addition to CD are diagnosed with inflammatory bowel disease (IBD) or type 1 diabetes (DM1) have a higher risk of low bone mineral density (BMD).

Materials and Methods: A total of 100 people (80 women and 20 men) with CD were recruited from the outpatient clinic. Based on the medical records, patients were divided into groups: group A - patients with CD, group B - patients with CD and IBD, group C - patients with CD and DM1. BMD, T-score, and Z-score of the lumbar spine (L1-L4) and femoral neck (FN) were assessed using the Lunar DPX-Plus device (Lunar Inc. Madison, WI, USA). Finally,

an appropriate statistical analysis was carried out.
Results: Sixteen percent of the patients had comorbid IBD and 10% of the patients had DM1, so the patients were divided into the following groups: 74 patients were classified in group A, 16 in group B and 10 in group C. The mean age of the patients was 40.3 years. There were statistically significant differences in body weight (57.3 vs. 73.2 kg) and BMI between group B and C patients (20.5 vs. 24.1 kg/m2). There were no significant statistical differences between the groups with regard to age, disease duration, FN BMD, FN T-score, FN Z-score, L1-L4 BMD, L1-L4 T-score, and L1-L4 Z-score. In the overall study group, 43% of patients had low BMD, of which 32% had osteopenia and 11% had osteoporosis. Osteopenia was present in 33.78% of patients in group A, 18.75% in group B and 40% in group C, while osteoporosis was present in 10.8% of patients in group A, 1.25% in group B and 1% in group C. Reduced BMD at the FN was present in 12.33% of patients in group A, 6.67% of patients in group B and 33.33% of patients in group C, and at L1-L4 in 23.61% of patients in group A, 28.57% of patients in group B and 10% of patients in group C, although these differences were not statistically significant.
Conclusions: Patients with CD have high risk of low BMD, but there is no difference in the prevalence of reduced BMD when IBD or DM1 cooccur. Further studies, including larger and equally sized groups, are needed to determine whether autoimmune comorbidities increase the risk of low BMD in patients with CD.
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CORRECTION OF BONE INJURY WITH MORPHOLINII THIAZOTAS

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Objective: The aim of the study was to investigate the possibilities of Morpholinii thiazotas as a corrector of bone injury.
Material and methods: An experimental study was conducted on 90 rats weighing 220-250 g. The animals were divided into three groups. The first group was a control, and the second was a group with bone trauma, in which rats had a hole made in the proximal metaphysis of both tibia with a dental drill. The third group consisted of rats that received daily intraperitoneal injection of a solution of Morpholinii thiazotas in dosage 117 mg/kg. The observation terms were 1, 7, 15, 30, and 60 days after the injury. The objects of the study: the pituitary gland and the pineal gland, which were studied at the organ, tissue, cellular and subcellular levels of organization using modern morphological research methods.
Results: Changes were found in the central parts of the endocrine system in the groups after bone injury, confirming the stages of fracture healing. In group of animals who received Morpholinii thiazotas, results were obtained indicating accelerated recovery and stabilization of pituitary and pineal structures at the final stage of consolidation of damaged bones. The administration of the drug increases the rate of recovery of the micro- and ultrastructure of the endocrine glands. The drug stimulates the synthetic activity of the glands without disrupting their structural organization and cell damage. Morpholinii thiazotas potentiates metabolic processes and, through stimulation of protein synthesis and acceleration of regeneration processes, has a positive effect on bone tissue repair.
Conclusions: The indirect effect of Morpholinii thiazotas on the central links of the endocrine system can affect the hypothalamic-pituitary axis, contributing to the coordination of regenerative processes and the body's adaptation to traumatic injuries.

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OSTEOARTHRITIS IN PATIENTS WITH RHEUMATOID ARTHRITIS: THE ROLE OF COMORBID PATHOLOGY AND PHARMACOTHERAPY

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The aim of our study was to analyze the frequency of osteoarthritis (OA) registration in patients (pts) with rheumatoid arthritis (RA) and to assess the role of cardiometabolic comorbidity, as well as antirheumatic therapy on the OA development.
Materials and methods. 107 hospital pts with RA: 20 (18.7%) men and 87 (81.3%) women aged 30 to 83 years (mean age 59.4 ± 4.6 years). All underwent a standard examination to verify RA, OA, cardiovascular (hypertension, coronary heart disease, heart failure) and metabolic (diabetes mellitus, obesity) pathology. A comparison of the comorbid pathology frequency and the nature of antirheumatic therapy was made in groups of pts with RA and OA combination and without concomitant OA.
Results. OA was diagnosed in 46 (43%) pts with RA, which was regarded as a secondary process. There were 7 men (15.2%) and 39 women (84.2%) in the group 1 (RA with OA), aged 46 to 83 years, the average age was 69.4±5.2 years. Five (10.9%) pts with secondary OA underwent joint replacement surgery (knee or hip joint). The frequency of cardiometabolic pathology in the group 1: hypertension - in 44 pts (95.7%), coronary heart disease - in 6 (13.0%), CHF - in 8 (17.4%) patients, obesity - in 28 (60.9%), type 2 diabetes - in 8 (17.4%). The group 2 (RA without OA) included 61 pts (57%), 13 men (21.3%) and 48 women (78.7%) aged 30 to 75 years, the average age was 54.3±4.9 years. The comorbid pathology spectrum was as follows: hypertension - in 42 (68.9%) pts, coronary heart disease - in 2 (3.3%), CHF - in 2 (3.3%), obesity - in 6 (9.8%), type 2 diabetes - in 3 (4.9%). In group 1, 44 (95.7%) pts received GC at an average dose of 6.5±1.2 mg/day in terms of prednisolone. All pts received DMARDs: methotrexate - 37 pts (80.4%), sulfasalazine - 5 (10.9%), leflunomide - 4 (8.7%).

In group 2, 32 pts (85.2%) received GC at an average dose of 3.2 ± 0.9 mg/day in terms of prednisolone. All pts received DMARDs: methotrexate - 55 (90.2%), sulfasalazine - 4 (6.6%), leflunomide - 2 (3.3%). Groups 1 and 2 differed significantly in terms of average age (t=2.14, p<0.05), frequency of cardiovascular and metabolic pathology (χ^2>4.0, p<0.05), and average dose of GC (t=2.2, p<0.05)

Conclusion. A combination of RA and OA was observed in 46% of hospital patients. An association of OA with age, the presence of cardiovascular and metabolic comorbidity, and long-term use of GC at a dose of more than 5 mg in terms of prednisolone was established.

P793

CLIMATE CHANGE AWARENESS AND HEALTH BEHAVIOURS RELEVANT FOR MUSCULOSKELETAL OUTCOMES: FINDINGS FROM THE HERTFORDSHIRE COHORT INTERGENERATIONAL STUDY

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Objective

Climate change is commonly reported by the media, leading to widespread discussion especially among younger adults. We hypothesized that this may result in lifestyle changes relevant to musculoskeletal health in young adults, specifically changes of active transport uptake and switching to a plant-based diet. We conducted a qualitative study to consider this further.

Materials and methods

We recruited 9 participants: 6 men and 3 women aged between 18 and 41 years old, from the Hertfordshire Cohort Intergenerational Study. Semi-structured qualitative interviews that considered awareness of climate change and lifestyle measures that had been adopted were conducted on Microsoft Teams. Interviews were recorded and transcribed verbatim. Thematic analysis was conducted using Braun and Clarke's approach.

Results

All respondents in our sample were educated to degree level. Several participants reported moving toward a plant-based diet, citing environmental concerns as a major reason behind this, although some did report other health benefits, including reduced risk of bowel cancer. Changes in physical activity were driven more commonly by practical concerns, specifically whether respondents had access to good public transportation, although some respondents did allude to the health and climate impact of active transport.

Conclusion

Several participants interviewed reported health behaviours that might impact their musculoskeletal health, especially peak bone mass acquisition. These data are now being assessed in a larger quantitative study. Further work in other populations, including older adults, is now warranted.

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P794

METHOTREXATE MAINTENANCE AND CLINICAL OUTCOMES AFTER TWO YEARS OF BIOLOGIC THERAPY IN RHEUMATOID ARTHRITIS: INSIGHTS FROM A TUNISIAN COHORT

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Background:

Biologic therapies (BT) have revolutionized rheumatoid arthritis (RA) management, yet access remains limited in low- and middle-income countries like Tunisia, highlighting the need for optimized methotrexate (MTX) use. While EULAR recommends maintaining MTX in RA patients, real-world data may differ.

Objectives:

To describe MTX maintenance, dose adjustments, discontinuations, and their associations with clinical outcomes two years after BT initiation.

Methods:

We conducted a retrospective, single-center study at La Rabta University Hospital, Tunis, including RA patients meeting the 2010 ACR/EULAR criteria and treated with BT. MTX doses and Disease Activity Score 28 - C-Reactive Protein (DAS28-CRP) scores were collected at BT initiation and after two years. Statistical analyses included Wilcoxon signed-rank, Student's t-test, and logistic regression.

Results:

Fifty RA patients (72% female, mean age 59 ± 12.6 years) were included. Most were ACPA-positive (86%) and had structural damage (98%). The mean disease duration at BT initiation was 7.6 ± 8.5 years. BT included TNF-α inhibitors (68%), CD20 inhibitors (22%), and IL-6 inhibitors (10%).

At BT initiation, all received MTX (mean 16.2 ± 3.65 mg). After two years, 10 patients (20%) discontinued MTX due to adverse effects, while 40 continued: 5% increased, 65% decreased, and 30% maintained the same dose. The mean MTX dose significantly decreased to 11.2 ± 6.4 mg ($p < 10^{-3}$). DAS28-CRP improved from 5.8 ± 0.8 to 4.5 ± 1.4 ($p < 10^{-3}$). MTX dose reduction was associated with lower DAS28-CRP scores (p = 0.02, OR = 6.8) and TNF-α inhibitor use (p = 0.02, OR = 7.5). Other factors showed no significant association.

Conclusion:

After two years, 80% of RA patients maintained MTX, with most reducing doses without compromising BT efficacy. These findings align with EULAR recommendations [1].

References:

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P795

CORTICOSTEROID OUTCOMES AFTER TWO YEARS OF BIOLOGIC THERAPY IN RHEUMATOID ARTHRITIS

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Background:
Biologic therapies (BT) have revolutionized rheumatoid arthritis (RA) management, improving disease control and a potential corticosteroid (CS) sparing effect.
Objectives:
To assess CS dose changes after two years of BT in RA patients.
Methods:
This retrospective study included RA patients from La Rabta University Hospital, Tunisia. Oral CS doses, expressed in prednisone equivalents (p.e), and Disease Activity Score 28 - C-Reactive Protein (DAS28-CRP) scores were recorded at BT initiation and after two years. Wilcoxon signed-rank and Student's t-tests were used for comparisons, with $p<0.05$ considered significant.
Results:
We included 50 RA patients, mainly female (72%; female-to-male ratio = 2.6). The mean age was 59 ± 12.6 years. Among them, 86% were anti-citrullinated protein antibodies (ACPA)-positive and 98% had structural damage. The mean disease duration at the time of BT initiation was 7.6 ± 8.5 years. BTs used included TNF-α inhibitors (68%), CD20 inhibitors (22%), and IL-6 inhibitors (10%).
At BT initiation, 49 patients were prescribed CS with a mean dosage of 7.9 ± ± 2.6 mg [5-15] (p.e): 14 patients (28.6%) received 5mg (p.e), 12 patients (24.5%) received a dose between 5 and 10 mg (p.e) and 23 patients (46.9%) received a dose ≥10 mg (p.e).
After two years of BT, 19 patients (38%) had the same CS doses, only one had higher doses, and 30 patients (60%) had lower doses. 10 patients (20%) were CS- free. The mean CS dose decreased to 5.6 ± 3.6 mg (p.e) after two years ($p<10^{-3}$).
Similarly, the mean DAS28-CRP score improved significantly from 5.8 ± 0.8 at BT initiation to 4.5 ± 1.4 after two years of BT ($p<10^{-3}$).
Age, gender, ACPA-positive status, structural damage, disease duration at the time of BT initiation, CS dose at BT initiation, DAS at BT initiation and type of BT were not statistically associated with CS decrease.
Conclusion:
BT enables significant CS tapering while maintaining disease control in RA patients. Future research should explore predictive factors for improved treatment strategies.

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HOW RELIABLE ARE THE ADRAR AND MAC KENNA INDICES IN DIAGNOSING OSTEOMALACIA? INSIGHTS FROM A RETROSPECTIVE STUDY

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Background:
Osteomalacia is a rare metabolic bone disorder characterized by defective mineralization, leading to increased bone fragility and diffuse musculoskeletal pain. Its nonspecific presentation makes diagnosis challenging. The Adrar and Mac Kenna indices have been proposed to aid diagnosis.
Objectives:
To describe the clinical, biological, and radiological features of osteomalacia and assess the diagnostic utility of the Adrar and Mac Kenna indices.
Methods:
We conducted a retrospective study of 45 patients hospitalized for osteomalacia between 2002 and 2022. Clinical symptoms (bone pain, muscle weakness, gait disturbances), biological parameters (calcium, phosphate, parathyroid hormone, 25-OH vitamin D, alkaline phosphatase, urinary calcium), and radiological findings (bone translucency, Looser-Milkmann lines, fractures) were analyzed. Adrar (≥25) and Mac Kenna (≥35) indices were calculated. Statistical analyses included chi-square tests and Pearson/Spearman correlations, with $p<0.05$ considered significant.
Results:
The mean age was 46.4±16.8 years (range: 14–70), with a female predominance (73%). Hypocalcemia (66.7%), hypophosphatemia (64.4%), and elevated alkaline phosphatase (93.3%) were common. Parathyroid hormones were elevated in 62.2%, and vitamin D deficiency was present in 84.5%. Radiological findings included bone translucency (91%), Looser-Milkmann lines (40%), and bone deformities (40%). Vitamin D deficiency was the leading cause (36%).
Significant correlations were found between bone pain and urinary calcium ($p=0.05$), muscle weakness and serum calcium ($p=0.04$), and gait disturbances with phosphate ($p=0.01$), alkaline phosphatase ($p=0.02$), urinary calcium ($p=0.01$), and vitamin D ($p=0.03$). Fractures were associated with low serum calcium ($p=0.01$), and bone deformities correlated with hypocalcemia ($p=0.01$).
The Adrar and Mac Kenna indices demonstrated high diagnostic reliability, with mean scores of 50.88±15.85 and 59.81±10.09, respectively. Both identified 97.8% of cases, with strong concordance ($p<10^{-3}$), confirming their diagnostic utility.
Conclusion:
A comprehensive diagnostic approach integrating clinical, biological, and radiological assessments is essential for osteomalacia. The Adrar and Mac Kenna indices are reliable tools for confirmation, enabling early intervention to prevent complications. Further research is needed to optimize long-term management strategies.

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ASSOCIATION BETWEEN COOKING OIL FUME EXPOSURE AND BONE MINERAL DENSITY AMONG POSTMENOPAUSAL WOMEN IN TAIWAN: A CROSS-SECTIONAL STUDY

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Objective

Exposure to air pollutants is increasingly recognized as a potential risk factor for impaired bone health (1). As cooking oil fumes (COF) represent a primary source of indoor air pollution, this study aimed to investigate the relationship between COF exposure and bone mineral density (BMD) among postmenopausal women in Taiwan.

Materials and Methods

This cross-sectional study included 5,283 postmenopausal women with regular cooking habits from the Taiwan Biobank between December 2008 and February 2020. Participants with a history of hormone replacement therapy were excluded. For general screening purpose, BMD was assessed using quantitative ultrasonography (QUS) of the calcaneus. COF exposure amount was quantified by multiplying the frequency of cooking (times per week) by the duration (years). Participants were categorized into higher and lower exposure groups based on the median exposure level. Multiple linear regression models were used to assess the association between COF exposure and BMD.

Results

The mean BMD was significantly lower in the higher exposure group (n=2,644) compared to the lower exposure group (n=2,639) (-1.03 ± 1.44 vs. -0.80 ± 1.45, p<0.0001). However, the multiple linear regression showed no significant association between higher COF exposure and BMD (β=0.07, 95% CI: -0.05 to 0.18, p=0.2683) after adjusting for potential confounders, including age, BMI, marital status, cigarette smoking, second-hand smoke exposure, tea drinking habits, exercise habits, diabetes, chronic kidney disease, duration and cause of menopause, cooking method, cooking fuel type, cooking oil type, and the use of a cooking hood.

Conclusion

This study found no significant association between COF exposure and BMD as measured by QUS in postmenopausal women. Further longitudinal studies are warranted to validate this finding and clarify the long-term impact of COF exposure on bone health.

Reference

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P798

NUTRITIONAL PROFILE IN OLDER PEOPLE WITH LOW BONE MINERAL DENSITY: PILOT NUTRITIONAL STUDY

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Objective: The objective of this study was to evaluate the nutritional profile of elderly people with low bone mineral density and physical performance, as a predictor for the increased risk of fractures due to falls in the older adults.
Methods: The cross-sectional pilot study consisted of 45 elderly people (35 female and 10 male) with a mean age of 67.7±5.9 years, assessed with low bone mineral density. Dual energy x-ray absorptiometry (DXA) was used to evaluate total mass, total lean mass (TLM), appendicular skeletal mass (ASM/H²), body mass index (BMI) and bone mineral density (BMD). For physical performance gait speed (GST) was used; Three-day food record and data were processed by DietBox software for nutritional analysis. The results were presented with descriptive analysis.
Results: We found mean BMI classifying overweight, 27 people with low muscle mass, 19 with low performance test in chair stand and gait speed tests (42.2%). Of the total, only two people had normal calcium intake. Table 2 presented high values of calories and sugar, while dietary fiber, minerals such as calcium and magnesium presented low daily intake in almost the entire sample; Vitamin D also showed very low values.
Conclusion: We conclude that inadequate intake of mineral and other nutrients may be the cause of bone fragility in the sample evaluated. We also consider that the fact that the majority of the sample presented low physical performance, increases not only the risk of falls, but also of fractures due to bone fragility.

P799

TREATMENT AND REHABILITATION OUTCOMES IN OSTEOARTHRITIS PATIENTS WITH COMORBID CONDITIONS

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Objective: To evaluate the effectiveness of comprehensive treatment and rehabilitation in patients with osteoarthritis (OA) combined with chronic obstructive pulmonary disease (COPD).
Materials and Methods: The study included patients with stage I-II OA combined with moderate to severe (stage 2-3) COPD. Of these, 20 patients had knee OA, 12 had polyosteoarthritis, and 10 had hip OA. Clinical-functional, radiological, and biochemical (ALT, AST, bilirubin, C-reactive protein (CRP)) assessments were conducted. Pulmonary function tests (PFTs) and peak flowmetry (PFM) data were analyzed. Magnetic resonance imaging (MRI) or computed tomography (CT) scans were performed as needed. Patients received individually tailored programs of ultraviolet

irradiation, ultra-high-frequency microwave therapy, extremely high-frequency therapy, magnetotherapy, or laser therapy. Against the background of basic COPD treatment, patients received a chondroprotector containing chondroitin sulfate and herbal extracts as a symptom- and structure-modifying slow-acting drug for 6 months (2 tablets twice daily, 5-10 minutes before meals).
Results and Discussion: During treatment, dyspnea decreased from 2.9±0.29 to 1.3±0.15 points and cough from 2.5±0.14 to 1.2±0.16 points. Regression of these symptoms occurred alongside a reduction in physical findings, weakness, sweating, and improvement in the overall condition of patients. PFM data revealed an increase in bronchial patency (from 305.6±21.9 to 343.4±23.1 L/min). Positive dynamics were observed in PFT and clinical-biochemical parameters. Inflammatory manifestations in the bronchopulmonary system decreased or resolved, correlating with laboratory indicators (CRP, leukocytes, ESR, sputum). Starting from the first month of treatment, patients reported a reduction in pain and other clinical signs of OA, with the most significant changes observed in the knee OA group. Pain during movement, measured on a visual analog scale (VAS), decreased from 70.7±11.2 to 31.7±3.8 mm by the third month of observation. In the same group, a significant reduction in resting pain (VAS) was observed, from 32.3±6.7 to 11.5±3.2 mm. The Lequesne Functional Index (LFI) in this group decreased from 6.5±1.1 to 4.15±0.39. In the polyosteoarthritis group, pain during movement (VAS) decreased from 72.5±26.7 to 28.9±6.7 mm by the third month (resting pain decreased from 30.4±7.1 to 13.4±4.2 mm; LFI decreased from 6.5±1.36 to 4.5±0.51). In patients with hip OA, pain during movement decreased from 81.0±10.1 to 37.9±6.8 mm, and resting pain decreased from 30.3±6.4 to 22.2±5.1 mm. LFI also decreased from 6.8±1.23 to 5.2±0.51. A significant decrease in pain index (VAS) during movement and at rest was observed in all three groups after 3 months of treatment. LFI decreased in all three groups after four weeks of chondroprotector intake, with the most significant decrease in the knee OA group. The chondroprotector allowed for a reduction in the dose or complete discontinuation of traditional nonsteroidal anti-inflammatory drugs (NSAIDs). Three months after the start of therapy, 21% of patients took NSAIDs as needed, while 79% discontinued them. Treatment of OA with comorbid conditions is a complex process targeting the pathogenetic mechanisms of the diseases. The anti-inflammatory properties of the chondroprotector components favorably influence the course of both diseases. Proper organization of rehabilitation measures is crucial for patients with comorbid pathology. Functional status, pain syndrome, range of motion in the joints, severity of dyspnea, motivation level, and smoking status are considered when selecting OA patients with COPD for rehabilitation. Objectification of the functional state shows that certain success can be achieved in patients with varying severity of OA and COPD The baseline rehabilitation potential should characterize the patient's capacity to utilize multifactorial mechanisms for restoring impaired health and normalizing various forms of life activity. The combined use of modern pharmacotherapy and rehabilitation can improve exercise tolerance in comorbid patients and positively influence the outcomes of the final stage of joint and pulmonary rehabilitation. Therapeutic exercises are a cornerstone of medical rehabilitation programs for patients with OA and COPD. This is due to the corrective influence of therapeutic exercises on the biomechanics of movement and respiration, improvement of bronchial patency, acceleration of the resolution of the inflammatory process, and increase in pulmonary function reserves. Available physiotherapy methods for OA and COPD include ultraviolet irradiation, ultra-high-frequency therapy (UHF), inductothermy, microwave therapy in the centimeter and decimeter ranges, extremely high-frequency therapy (EHF), amplipulse therapy, and magnetotherapy. All these methods reduce inflammatory manifestations in the joints and bronchi, improve joint mobility and bronchial patency, decrease exudative reactions in the lung parenchyma, exert a bacteriostatic effect, and provide an immunomodulatory effect. Acupuncture, electroacupuncture, laser acupuncture, and acupressure can also be incorporated. Laser radiation has an anti-inflammatory effect, increases the body's reactivity, and improves blood rheological properties. Clinical manifestations of this effect include resolution of inflammation, including synovitis, and reduction of bronchial mucosa edema. Hirudotherapy (leech therapy) can be widely used in the outpatient rehabilitation phase. The use of combined chondroprotectors in the treatment of patients with OA in combination with COPD leads to a faster reduction in pain, shorter hospital stays, and restoration of daily activity. The obtained results demonstrate the effectiveness of combined chondroprotectors in OA therapy and the possibility of their use in general medical practice. In addition to physical rehabilitation, all patients are recommended to perform breathing exercises for 20 minutes 2-3 times a day, including the following exercises: pursed-lip breathing, resistance exhalation, breathing in a bent position with a forward lean, and diaphragmatic breathing exercises.
Conclusions: For patients with OA and COPD, combined joint and pulmonary rehabilitation programs are recommended to improve quality of life, increase exercise tolerance, and reduce the severity of clinical symptoms. Modern treatment and rehabilitation of OA with COPD aims not only to reduce pain and improve the functional state of the affected organs but also to slow the progression of the disease through the complex use of non-pharmacological and pharmacological methods, contributing to a reduction in disability and improvement in the quality of life of patients.

P800

SEASONAL VARIATIONS IN VITAMIN D3 IN PATIENTS WITH OSTEOPOROSIS

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The body's supply of endogenous cholecalciferol (vitamin 25(OH) D3) depends on age, gender and a number of other parameters, and also changes significantly throughout the year depending on the season. However, the question of practical recommendations regarding the timing of the administration of vitamin D preparations depending on the time of year remains open to discussion.
The aim of the study was to study the fluctuations in vitamin D levels in patients with osteoporosis (OP) depending on the season.

Materials and methods. We studied the level of vitamin 25 (OH) D3 in 396 patients (mean age 54.07 ± 11.32) diagnosed with OP/osteopenia, including 376 (94.95%) women and 20 (5.05%) men. There were 245 patients with a history of fractures, and 151 patients without fractures. All patients underwent dual-energy X-ray absorptiometry on a Lunar DPX device. The diagnosis of OP was made based on the clinical guidelines Osteoporosis-2021 approved by the Ministry of Health of the Russian Federation. The level of vitamin 25 (OH) D3 was determined using a kit for enzyme-linked immunosorbent assay 25-OH Vitamin D ELISA. Results. The maximum levels of average 25(OH)D3 values were observed in June (90.38 nmol/l), and the minimum value in January (50.85 nmol/l, p<0.001). During July-November, the average values of vitamin D level were 65.94-73.89 nmol/l (the differences are statistically insignificant). In order to identify the number of patients requiring drug prophylaxis of hypovitaminosis D, we calculated the number of patients with vitamin D deficiency. We found that during the year, the majority of patients have a deficiency of this indicator. The highest percentage of patients with vitamin D deficiency was observed in April and May (16.67 and 12.24%, respectively). In the period from June to September, the incidence of hypovitaminosis was significantly lower and amounted to 1.92–3.7%. Despite the fact that the lowest average 25(OH)D3 values are observed in January and December, there were no patients with a deficiency of this indicator in these months. We also studied the relationship of 25(OH)D3 with the age of patients. We found that with increasing age of patients, a gradual decrease in the level of 25(OH)D3 in the blood is observed (r = - 0.099, p = 0.049). Conclusions. We found significant seasonal fluctuations in 25(OH)D3 in the examined group of patients. The influence of the seasonal factor on the level of vitamin D was proven using statistical analysis methods. No statistically significant differences were found in the average levels of vitamin D in the summer months, accompanied by high solar activity (July-August) and autumn (September-November). This fact can be explained by the short time spent outdoors on hot summer days, which does not contribute to sufficient production of endogenous 25(OH)D3. Based on the results identified, it is recommended to carry out prevention of vitamin D deficiency. For the population of the Volgograd region, prevention should be carried out from September to May, in accordance with international recommendations. This is especially important for older patients.

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EVALUATION OF THE REMOTE RESULTS OF COMPREHENSIVE REHABILITATION OF PATIENTS WITH VERTEBRAL FRACTURES AGAINST THE BACKGROUND OF OSTEOPOROSIS WITH THE INCLUSION OF MECHANOTHERAPY AND INTERACTIVE BALANCE THERAPY WITH BIOLOGICAL FEEDBACK

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Relevance. Rehabilitation of patients with vertebral fractures (VF) against the background of osteoporosis (OP) requires a personalized approach and the use of modern low-traumatic methods of restorative medicine. According to Svensson H.K. et al. (2017), personally selected physical exercise programs for patients with VF against the background of OP with varying degrees of evidence affect motor functions, pain, quality of life, pain level and fear of falls. However, the data are ambiguous and sometimes contradictory. According to Genev I.K. et al. (2017), despite numerous options for non-drug treatment of compression VF against the background of OP, there is currently no consensus on the management of patients with these fractures. Objective: to evaluate the effectiveness of a new rehabilitation complex in the long-term period in patients with VF against the background of OP, including mechanotherapy and interactive balance therapy with biofeedback. Material and methods. The study included 120 patients aged 40-80 years with at least one PP at the ThIV-LV level dating from 4 to 12 weeks and bone mineral density (BMD) values in the LI-LIV segment or femur ≤ -2.0 according to the T-score. Patients in group 1 received a new physical therapy complex for 20 days with the inclusion of mechanotherapy technologies with biofeedback (patent No. 2709843, state registration date December 23, 2019), which included: 1) 10 sessions on a group of exercise machines with biofeedback to increase back muscle strength; 2) 10 sessions of interactive balance therapy on an unstable platform with biofeedback; 3) 15 group hydrokinesitherapy sessions in fresh water in a therapeutic pool with an instructor to increase muscle strength and improve coordination; 4) 15 group sessions of therapeutic gymnastics in the gym with the duration, using the modified and adapted for patients with OP Gorinevskaya-Drewing method. Patients of group 2 (comparison group) were prescribed a set of 15 group sessions of hydrokinesitherapy and 15 sessions of therapeutic gymnastics according to the Gorinevskaya-Drewing method (without the use of mechanotherapy methods with biological feedback). Functional tests and the level of back pain were assessed after 70 days, 6, 12 and 24 months, BMD by bone densitometry was studied after 12 and 24 months. Results and discussion. The level of back pain in group 1 was 2.5 [0; 3.0] points after 6 months (p = 0.005 compared with the initial level), 1.0 [0; 1.0] points after 12 months (p=0.003 compared to baseline; p=0.0009 compared to group 2) and 1.5 [0; 2.0] points after 24 months (p=0.038 compared to baseline). In group 2, at similar stages, the pain intensity was, respectively, 3.0 [0; 3.0] points (p=0.006 compared to baseline), 3.0 [0.5; 3.0] points (p=0.022) and 2.5 [0; 3.0] points (p=0.041). In group 1, on the 70th day and subsequently at all stages of remote observation, the time to complete the "Stand up and go" test was significantly lower than before the start of rehabilitation (p<0.05). In group 2, improvement in the results of this test was noted only after 6 and 12 months from the start of rehabilitation (p<0.05). In group 1, a statistically significant increase in BMD in the lumbar spine segment LI-LIV by 1.82% [-1.17; 5.48] was noted after 12 months

(p=0.045) and by 3.24% [-1.41; 12.8] after 24 months (p=0.038). Also in the main group, after 24 months, an increase in BMD in the femoral neck by 2.45% [-2.23; 10.6] was noted (p=0.029). No significant dynamics of densitometric indicators were recorded in group 2, either after 12 or 24 months (p>0.05). Probably, the main factor that influenced this result was the different proportion in the groups of patients who received pathogenetic drug therapy for OP - bisphosphonates or denosumab during the observation period. The proportion of such patients who received basic therapy for OP in group 1 was 39/47 (83.0%) after 12 months and 18/21 (85.7%) after 24 months, in group 2 - 21/43 (48.8%, p = 0.0006 compared with group 1, Pearson χ2) and 9/16 (56.3%, p = 0.046 compared with group 1, Pearson χ2). Obviously, patient monitoring after a fracture by a health care professional, close interaction and contact between the doctor and the patient significantly increase the degree of adherence not only to medical rehabilitation procedures, but also to drug treatment for OP. In this aspect, the role of personal control by a physician in physical and rehabilitation medicine, his participation in patient education and monitoring of the correct implementation of the recommended treatment is extremely important.
Conclusions: In patients with PP against the background of OP, the use of a new rehabilitation method with the inclusion of mechanotherapy and interactive balance therapy with biofeedback is associated with rapid regression of pain syndrome and with an increase in the motor activity of patients, and also increases adherence to OP therapy, which contributes to an increase in BMD in the spine after 12 and 24 months, and in the femoral neck after 24 months. A 20-day complex, including training on exercise machines with biofeedback and interactive balance therapy against the background of group therapeutic exercise classes in the gym and in the pool is recommended for the 2nd stage of medical rehabilitation of patients with osteoporosis in periods from 4 to 12 weeks after clinical compression PP.

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HIGH RISK OF FRACTURES AMONG RESIDENTS OF THE RUSSIAN FEDERATION

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Objective: to determine the frequency of high risk of major osteoporotic fractures (MOF) among residents aged 50 years and older in different regions of the Russian Federation. Material and methods: The study included 13,941 women (average age 61.5 ± 9.8 years) (stratified samples of cities in 7 federal districts (FD)) and 4,077 men (average age 61.9 ± 10.2 years) (stratified samples in 5 FDs). Participants were surveyed using the risk factors questionnaire included in FRAX®, on the basis of which the absolute ten-year risk of MOF was calculated without entering data on bone mineral density of the femoral neck. A high risk was considered to be a FRAX® value above the Russian age-dependent threshold for therapeutic intervention. Results: FRAX® indicators for major MOF were significantly higher in women compared to men, regardless of the region of residence. The highest FRAX® values were found in women in the Far Eastern Federal District (15.0% [10.0, 23.0], (Me [Q25, Q75]), and the lowest in women in the Volga Federal District (11.0% (7.8, 16.0)) (p < 0.001). Among men, this indicator was higher in residents of the Northwestern Federal District (6.3% [4.4, 10.0]), and the lowest, as well as among women, in the Volga Federal District (4.6% [4.2, 8.1]) (p < 0.001). Among all survey participants, 31% of women had FRAX® values corresponding to a high risk of AKI, while among men, only 5% of respondents reached the threshold of therapeutic intervention. An increase in the number of women with FRAX® values above the threshold of therapeutic intervention was noted depending on the age of the surveyed: from 23% at the age of 50-59 years old to 51.3% at the age of 80 years and older. No such pattern was obtained for men: most often, a high risk of fractures was determined at the age of 50-59 years (7.8%), and in other age groups it was slightly more than 3%. A high risk of fractures was more often detected among female residents of the Far Eastern Federal District (38.5%), the Ural Federal District (34.8%), the Siberian Federal District (33.7%) and the Central Federal District (32%) compared to representatives of the Volga Federal District (24%) and the Southern Federal District (25.8%) (p <0.001). Among men, individuals with high fracture risk were more common in the Northwestern Federal District (10.2%) and the Ural Federal District (8.8%) compared to those living in other regions of the country (p<0.001), the frequency of high FRAX® among men in the Volga Federal District (4.4%), Central Federal District (3.6%) and Siberian Federal District (2.8%) did not differ statistically (p>0.05). Conclusion: 31% of women and 5% of men aged 50 years and older had a high fracture risk according to the FRAX® algorithm. High fracture risk was determined more often in women in the Far Eastern, Siberian, Ural and Central Federal Districts than in other regions, and in men in the Northwestern and Ural Federal Districts.

P803

EVALUATION OF VITAMIN D METABOLISM IN PATIENTS WITH CUSHING'S DISEASE IN RESPONSE TO TREATMENT WITH COLECALCIFEROL AT A DOSE OF 150,000 IU

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Objective: to evaluate vitamin D metabolism in patients with Cushing's disease (CD) compared to healthy individuals during a bolus load of cholecalciferol.
Materials and methods: the main group included 30 adult patients with active CD, the control group included 30 healthy volunteers matched for age, gender and BMI. All participants received a single dose (150,000 IU) of aqueous cholecalciferol solution orally. Blood vitamin D metabolites (25(OH)D3, 25(OH)D2,1,25(OH)2D3, 3-epi-25(OH)D3 and 24,25(OH)2D3), free 25(OH)D, vitamin D-binding protein (DBP) and parathyroid hormone (PTH), as well as blood and urine biochemical parameters were determined before and on days 1, 3 and 7 after cholecalciferol administration.

Results: In patients with CCD, 25(OH)D3 levels were similar to those in healthy individuals throughout the study ($p > 0.05$), but higher 25(OH)D3/24,25(OH)2D3 ratios were observed ($p < 0.05$). They also had lower baseline free 25(OH)D ($p < 0.05$) despite comparable DBP levels ($p>0.05$) and lower albumin levels ($p < 0.05$). 24-hour urinary free cortisol correlated with baseline 25(OH)D3/24,25(OH)2D3 ratio ($r = 0.36$, $p < 0.05$). The increase in 25(OH)D3 by day 7 after taking cholecalciferol in patients with ICD was similar in the presence and absence of obesity and did not correlate with BMI ($p > 0.05$), unlike the control group. Conclusions. In general, patients with ICD had consistently higher 25(OH)D3/24,25(OH)2D3 ratios, indicating reduced 24-hydroxylase activity. Altered activity of the main enzyme of vitamin D catabolism in patients with ICD may influence the effectiveness of cholecalciferol treatment. The observed difference in baseline levels of free 25(OH)D is not entirely clear and requires further study.

P804

ASSESSMENT OF QUALITY OF LIFE INDICATORS IN PATIENTS WITH FRACTURES OF THE PROXIMAL FEMUR AND IN INDIVIDUALS WITHOUT FRACTURES

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Objective. To assess the quality of life of patients with proximal femur fractures.
Materials and methods. The quality of life was studied in 173 women and 46 men aged 50 years and older with hip fractures sustained with minimal trauma. The control group consisted of 150 women and 50 men aged 50 years and older without a history of hip fractures. A total of 419 people were included in the study. The quality of life of patients with proximal femur fractures was assessed using the QOL questionnaire: SF-36. Results. It was found that among the scales characterizing the physical component of health, statistically significant differences between the groups were obtained for the indicators of physical functioning - 9.46% ($p = 0.002$) and role functioning due to physical condition - 11.2% ($p = 0.001$). There were no statistically significant differences between the groups in terms of general health and pain intensity (3.85% and 1.16%, respectively) ($p> 0.05$). For the scales that make up the mental component of health, statistically significant differences between the groups were found for the mental health indicator of 4.4% ($p=0.03$) and the role functioning indicator due to emotional state of 6.5% ($p=0.006$). The social functioning indicator did not differ significantly between the groups and amounted to 1.85% ($p=0.26\%$). In the group with hip fractures, the vital activity scale indicator was 2.92% higher than in the group without fractures, however, no statistically significant differences were found between the groups ($p=0.12$). There were no statistically significant differences in the physical and psychological health components (3.91% and 2.38%, respectively) ($p> 0.05$). Conclusions. Thus, in the group of individuals with hip fractures, quality of life indicators were reduced to a greater extent and in most parameters than in the group of individuals without fractures.

P805

OSTEOPOROTIC FRACTURE INCIDENCE AND 10-YEAR FRACTURE RISK IN PATIENTS WITH SYSTEMIC SCLERODERMA

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Objective: to determine the incidence of fragility fractures in patients with systemic sclerosis (SSc) and to calculate the 10-year risk of new major osteoporotic fractures. Materials and methods: The study included 230 patients with SSc according to the ACR/EULAR 2013 criteria: 180 (78.3%) women (110 (61.1%) postmenopausal) and 50 (21.7%) men (33 (66%) over 50 years). The median age was 54.0 [42.0; 61.0] years, the median disease duration was 7.0 [3.25; 12.0] years. For postmenopausal women and men over 50 years, the risk of major osteoporotic fractures was calculated using the FRAX tool, as a result of which patients were divided into low, intermediate or high risk groups. Patients with moderate risk underwent dual-energy X-ray absorptiometry of the femoral neck (FE) and FRAX was recalculated with inclusion of the FE T-score value. Results and discussion: Low-energy fractures in the anamnesis were present in 59 (25.6%) patients: vertebral fractures - in 27 (15.0%) women and 8 (16.0%) men, peripheral fractures - in 31 (17.2%) women and 2 (4.0%) men, of which 9 (5.0%) women and 1 (2.0%) man had both vertebral and peripheral fractures. Among all patients, only 1 (2.0%) man had a fracture of the proximal femur. FRAX calculation showed that 36 (25.2%) patients (12 (10.9%) women and 24 (72.7%) men) had a low risk of osteoporotic fractures, 60 (41.9%) patients (51 (46.4%) women and 9 (27.3%) men) had an average risk. The high-risk group included 47 (42.7%) women and no men. After recalculating FRAX with the inclusion of the SB T-score in individuals with an average risk, 9 (8.2%) women and 2 (6.0%) men were in the high-risk group, 14 (12.7%) women and 1 (3.0%) man were in the very high-risk group, and 34 (30.9%) women and 6 (18.2%) men were in the low-risk group. 6 (18.2%) men and 3 (2.7%) women with a history of fragility fractures had low risk according to FRAX, but they should also be considered as high-risk patients. Conclusions: 59 (25.6%) patients with SSD had fragility fractures. The incidence of vertebral and peripheral fractures did not differ in women. Vertebral fractures were significantly more common among men. High risk of osteoporotic fractures was significantly more common in women (66.4%) compared to men (27.3%).

P806

PSORIATIC ARTHRITIS WITH SEVERE MUSCULOSKELETAL MANIFESTATIONS AND ERYTHRODERMIC PSORIASIS. SUCCESSFUL TREATMENT WITH IV AND SC INFLIXIMAB

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Psoriatic arthritis is a systemic autoinflammatory disease which may be accompanied by psoriasis. Psoriatic arthritis is accompanied by musculoskeletal manifestations. A very rare form of psoriasis is erythrodermic psoriasis. Erythrodermic psoriasis represents a rare variant of psoriasis and accounts only for 1-2% of psoriasis patients. It is characterized by erythema and scaling affecting almost the whole of body surface, namely 75-90% of it. Patients may present with systemic symptoms, such as pruritus, fever, chills, dehydration, joint pain, fatigue and lymphadenopathy. Triggers for this rare variant of psoriasis are severe emotional stress and a preceding illness.

The aim was to describe the case of a female patient who presented with psoriatic arthritis, severe musculoskeletal manifestations and erythrodermic psoriasis, which was managed successfully by topical treatment and IV followed by SC administration of infliximab.

A female patient, aged 41 years, suffering from psoriatic arthritis with severe musculoskeletal manifestations presented with diffuse erythema and scaling affecting almost the whole of body surface and systemic symptoms. The patient reported severe emotional stress within the previous week. The patient had a fever in spikes, fatigue and arthralgias.

Topical preparations were applied to treat the skin erythema and scaling. Antibiotics were administered along with intravenous fluids and prednisolone. Infliximab IV was administered and the patient improved significantly. Subsequently, SC infliximab was given.

Psoriatic arthritis, a systemic autoinflammatory disease with musculoskeletal manifestations, may be accompanied by psoriasis. The case of a patient is described herein who presented with erythrodermic psoriasis in the context of psoriatic arthritis with musculoskeletal manifestations following severe emotional stress. Infliximab was administered along with topical treatment with significant improvement. Biological agents have revolutionized the treatment of erythrodermic psoriasis and have offered hope in the management of this rare and severe form of psoriasis, which in this case was observed in the context of psoriatic arthritis.

P807

DOSE MATTERS: A COMPARISON OF 5,000 IU AND 50,000 IU VITAMIN D SUPPLEMENTATION

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Background: Vitamin D is a steroid hormone essential for calcium homeostasis, bone health, and numerous physiological processes, including immune function and inflammation. Vitamin D deficiency (<20 ng/mL) and insufficiency (20–30 ng/mL) are common and associated with various health risks. Effective repletion of vitamin D levels is crucial, but the optimal dosing strategy remains debated. Adherence to daily supplementation may also influence outcomes.

Objective: The purpose of this study is to compare the efficacy of two vitamin D supplementation regimens: 5,000 IU daily and 50,000 IU weekly in rapidly increasing serum vitamin D levels in patients with deficiency and insufficiency, while also evaluating adherence and convenience of weekly versus daily dosing.

Methods: A total of 800 patients (ages 25–50) with documented vitamin D deficiency or insufficiency were enrolled and randomized into four groups:

- Group 1 (n=200): Vitamin D 5,000 IU daily (deficiency group).
- Group 2 (n=200): Vitamin D 50,000 IU weekly (deficiency group).
- Group 3 (n=200): Vitamin D 5,000 IU daily (insufficiency group).
- Group 4 (n=200): Vitamin D 50,000 IU weekly (insufficiency group).

Serum 25(OH)D levels were measured at baseline, 6 weeks, and 12 weeks. Adherence was assessed using patient diaries and pill counts. Patients were educated on the importance of consistent supplementation.

Results: At 6 weeks, both 50,000 IU groups (Group 2 and Group 4) showed a faster and more significant rise in serum 25(OH)D levels compared to the 5,000 IU groups. By 12 weeks, Group 2 (50,000 IU weekly, deficiency) achieved a mean serum level of 36 ng/mL (±5), while Group 1 (5,000 IU daily, deficiency) reached 28 ng/mL (±6). Similarly, Group 4 (50,000 IU weekly, insufficiency) achieved a mean level of 40 ng/mL (±8), while Group 3 (5,000 IU daily, insufficiency) reached 30 ng/mL (±5). Adherence was higher in the weekly dosing groups (Groups 2 and 4) compared to the daily dosing groups (Groups 1 and 3), with 92% of patients completing the weekly regimen versus 78% for daily dosing.

Conclusion: Weekly supplementation with 50,000 IU of vitamin D is not only more effective for rapidly increasing serum vitamin D levels but is also more convenient, leading to better adherence compared to daily 5,000 IU dosing. These findings suggest that 50,000 IU weekly is a superior option for repleting vitamin D levels in both deficient and insufficient patients, particularly in real-world settings where adherence is a concern.

P808

TERIPARATIDE IN A HEMODIALYSIS PATIENT WITH HIGH TURNOVER BONE DISEASE AND MULTIPLE FRACTURES: A CASE REPORT

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Objetive: Chronic kidney disease (CKD)–induced osteoporosis represents one of the skeletal components of chronic kidney disease–mineral and bone disorder (CKD–MBD) associated with a 3-5 fold increased fracture risk. Its management faces several challenges, since some anti-osteoporotics are contraindicated or the data for their use is limited. Successful use of teriparatide has been reported in patients with low turnover bone disease and in hypercalcemia associated with adynamic bone disease. Here, a case of an elderly female patient with CKD stage 5 on hemodialysis and multiple fractures due to high turnover bone disease treated with teriparatide is presented.

Case Presentation:

A woman (born 1941) with polycystic kidney disease had been treated for postmenopausal osteoporosis without fractures with bisphosphonates since 2007 for 6 years. After 5 years of drug holidays with significant BMD decrease, denosumab 60 mg every 6 months was initiated and increased lumbar BMD after 2 years. Meanwhile, CKD progressed to dialysis. Despite prevention, transient episodes of hypocalcemia-induced hyperparathyroidism after each administration of denosumab were observed. In 2019, serum calcium and PTH significantly increased (2.82 mmol/l and 35 pmol/l respectively) and a hyperplasia of upper right parathyroid gland was suspected based on MIBI. The patient refused surgical treatment, thus cinacalcet 30 mg daily was initiated, resulting in normal calcemia (2.54 mmol/l) and a decrease in PTH (23 pmol/l). In 2021, DXA revealed significant decrease in BMD in the proximal femur, and CT confirmed multiple compressive fractures of Th12, L1, and L2. With the patient's approval, teriparatide 20 µg daily was administered, leading to a significant increase in lumbar BMD after 2 years without any new fractures, and normalization of calcemia (with consequent withdrawal of cinacalcet). After termination of teriparatide, ibandronate 3 mg i.v. was administered every three months. The patient died after 11 months due to cardiovascular complications.

Conclusions: Teriparatide also appears to be effective and safe in high turnover CKD-MBD (with tertiary hyperparathyroidism well controlled on cinacalcet), complicated by multiple vertebral fractures.

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P809

STRUCTURAL DAMAGE AND CORTICOSTEROID DOSES IN RHEUMATOID ARTHRITIS: IS THERE A LINK?

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Introduction:

Corticosteroids play a significant role in the management of rheumatoid arthritis (RA). They control inflammation and provide protection against structural progression.

Objective:

This study aims to evaluate the structural damage in patients with RA and the corticosteroid doses they receive, in order to determine if there is a link between the two.

Methodology:

Consecutive patients with rheumatoid arthritis according to the ACR/EULAR 2010 criteria were enrolled. Socio-demographic data, daily doses of corticosteroids, and cumulative doses were recorded. Structural damage was assessed using the Sharp score, which evaluates the presence of erosions in 17 joint sites and joint narrowing at 18 sites in the hands. A score from 0 to 5 was given for each joint based on the severity of the erosions (total erosion score: 0–170). A score from 0 to 4 was given for joint narrowing (total narrowing score: 0–144). The total score is 448.

Results:

A total of 70 patients were included, with a sex ratio of 0.27 (15 men and 55 women). The average age was 55 ± 13 years, and the mean disease duration was 104.3 ± 102 months. Cs-DMARDs were prescribed to 64 patients (91.4%), and b-DMARDs were prescribed to 21 patients (30%).

Sixty-five patients (92.9%) were receiving systemic corticosteroids, with an average daily dose of 19.6 ± 13.8 mg and an average cumulative dose of 4.8 g ± 1.2 g. The mean Sharp score was 28.17 ± 3. There was no correlation between the Sharp score and the daily dose of corticosteroids ($r = 0.043$, $p = 0.728$), nor with the cumulative corticosteroid dose ($r = 0.137$, $p = 0.381$).

Conclusion:

This study suggests that the structural effect of corticosteroids is not dose-dependent.

Given their protective structural effects and their dose-dependent adverse effects, it is necessary to prescribe corticosteroids at the lowest effective dose.

P810

PULMONARY INVOLVEMENT IN RHEUMATOID ARTHRITIS: A DESCRIPTIVE STUDY

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Introduction:
Pulmonary involvement in rheumatoid arthritis (RA) is common and is associated with significant morbidity and mortality. Early diagnosis is essential.
objective:
This study aims to assess pulmonary involvement in RA from clinical, spirometric, radiographic, and computed tomography (CT) perspectives.
Methods:
Consecutive RA patients, diagnosed according to the ACR/EULAR 2010 criteria, were enrolled. A comprehensive respiratory evaluation, including clinical, radiographic, spirometric, and computed tomography assessments, was performed.
Statistical analysis was carried out using SPSS software.
Results:
A total of 70 patients were included, with a sex ratio of 0.27 (15 men and 55 women). The mean age was 55 ± 13 years, the mean disease duration was 104.3 ± 102 months, and the mean DAS28-ESR score was 3.5 ± 1.4. RA was seropositive in 62 cases (88.6%), erosive in 54 patients (77.1%), and deforming in 24 patients (34.3%).
Dyspnea was reported by 11 patients (15.7%). Two patients (2.9%) reported a cough, and three patients (4.2%) had crackles on lung auscultation.
Chest X-ray revealed interstitial lung disease (ILD) in 5 cases (7.1%). Spirometry showed a mean FEV1 of 98 ± 14%, a mean vital capacity (VC) of 95 ± 12%, and a median FEV1/FVC ratio of 101 ± 11%. Four cases (5.7%) of restrictive syndrome were noted.
Thoracic CT demonstrated abnormalities in 24 patients (34.3%), distributed as follows: reticulations in 10 patients (14.3%), distortion in 3 patients (4.3%), septal thickening in 9 patients (12.9%), traction bronchiectasis in 11 patients (15.7%), honeycombing in 7 patients (10%), consolidation in 2 patients (2.9%), ground-glass opacity in 13 patients (18.6%), PINS in 6 patients (8.6%), UIP in 2 patients (2.9%), and rheumatoid nodules in 16 patients (22.9%).
Conclusion:
This study suggests that pulmonary involvement in RA is common, primarily characterized by rheumatoid nodules and ground-glass opacity. The most frequent abnormalities are observed on chest CT, whereas chest X-ray and spirometry appear to be less sensitive.

P811

IMPACT OF AGE AND GENDER ON DISEASE SEVERITY AND PULMONARY INVOLVEMENT IN RHEUMATOID ARTHRITIS

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Introduction:
Rheumatoid arthritis (RA) is a chronic inflammatory disease that predominantly affects women, especially during the peri-menopausal period. While typically diagnosed in middle-aged adults, its presentation and progression in the elderly can differ significantly.
objective:
This study aims to evaluate the impact of age and gender on disease severity, structural damage, and pulmonary involvement in RA.
Methodology:
Consecutive patients diagnosed with RA according to the 2010 ACR/EULAR criteria were recruited. Socio-demographic, clinical, and para-clinical data were recorded. Statistical analysis was performed using SPSS software.
Results:
A total of 70 patients were included, sex ratio was 0.27 (15 men and 55 women). The mean age was 55 ± 13 years, mean disease duration was 104.3 ± 102 months, and mean DAS28-ESR score was 3.5 ± 1.4. RA was seropositive in 62 cases (88.6%), erosive in 54 patients (77.1%), and deforming in 24 cases (34.3%). The mean Sharp score was 28.17 ± 3.
Thoracic CT revealed abnormalities in 24 patients (34.3%), distributed as follows: reticulations in 10 patients (14.3%), distortion in 3 patients (4.3%), septal thickening in 9 patients (12.9%), traction bronchiectasis in 11 patients (15.7%), honeycombing in 7 patients (10%), consolidation in 2 patients (2.9%), ground-glass opacity in 13 patients (18.6%), PINS in 6 patients (8.6%), UIP in 2 patients (2.9%), and rheumatoid nodules in 16 patients (22.9%).
This study showed that men had significantly higher Sharp scores (32± 7 versus 19±2, p=0.36) and DAS28-ESR (4.8±2 versus 3.1±1, p=0.025) compared to women. On the other hand, there was a significantly higher prevalence of pulmonary involvement in elderly patients compared to younger patients (p=0.023).
Conclusion:
Male gender is associated with worse prognostic outcomes in terms of disease activity and structural damage, while elderly age serves as a risk factor for pulmonary involvement in RA.

P812

THE ROLE OF TRABECULAR BONE SCORE IN PATIENTS WITH HIGH BONE MASS BY DXA

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Objective: Reports of high bone mass (HBM) on routine DXA scanning are relatively common in clinical practice. The goal of this study is to compare a group of HBM individuals with a control group, assessing TBS and osteoarthritis rates differences between groups. Material and Methods: A database of DXA scans performed from 2019 to 2024 in a tertiary center in South Brazil was searched for patients with HBM, defined as femur or lumbar spine Z-score of ≥ 2.5. A control group with Z-score ≤ 2.5 matched by age, sex, BMI and ethnicity was adopted, being both groups assessed for evident signs of osteoarthritis in DXA scans. Results: 792 exams from 493 individuals revealed 65 individuals with HBM, from which 63 were paired with controls. Most patients were women (64.3%) and caucasian (93.7%), with median age and BMI of 71 years-old and 27.9kg/m2, respectively. Femoral neck and L1-L4 lumbar spine BMD was significantly different between groups (0.867 vs 1.003g/cm2; p<0.001; 1.078 vs 1.445g/cm2; p=0.000), as well as Z-score (0.1 vs 1.2; p<0.001; 0.1 vs 3.1; p=0.000), but L1-L4 TBS did not differ between groups (1.354 vs 1.376; p=0.246). TBS was poorly correlated with hip and lumbar BMD in both groups, and such correlation was significant only in the control group (r=0.243; p=0.05; r=0.337; p=0.007; respectively). Signs of evident osteoarthritis were evenly distributed between groups in both lumbar and hip sites (χ2=0.9; p=0.392; χ2=0.2; p=0.684, respectively). Conclusion: An important artifact in bone imaging, osteoarthritis did not seem to be significantly different for patients with HBM, suggesting that other factors may play a role in the process. A complementary tool to assess bone health, TBS seems not to be different in patients with HBM, remaining suitable for such patients in bone global assessment. Acknowledgments: INCT Hormônios e Saúde da Mulher, FIPE/HCPA.

P813

OSTEOPOROSIS AND OSTEOARTHRITIS IN ANKYLOSING SPONDYLITIS LINKED TO CHLAMYDIA TRACHOMATIS

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Background:
Chlamydia trachomatis is a known trigger for ankylosing spondylitis (AS) and other forms of seronegative spondyloarthritis (SpA). Its role in systemic bone complications, including osteoporosis (OP) and osteoarthritis (OA), is underexplored. This study investigates the clinical, diagnostic, and bone health impacts of *Chlamydia trachomatis* in AS, with a focus on osteoporosis and osteoarthritic changes.

Objectives:
To evaluate osteoporosis prevalence and osteoarthritic changes in patients with AS associated with *Chlamydia trachomatis*, using molecular diagnostics and advanced imaging techniques.

Methods:
From 2015 to 2021, 138 SpA patients were examined at "Timofei Moșneaga" Republican Clinical Hospital. *Chlamydia trachomatis* monoinfection was confirmed in 87 patients (63%) using PCR. Subgroups included axial AS (n=21), peripheral SpA (n=34), and mixed SpA (n=32). Bone health assessments included DXA scans for osteoporosis and imaging (X-ray, MRI) for OA. Clinical and laboratory evaluations (CRP, ESR, HLA-B27) were also conducted.

Results:

- **Osteoporosis prevalence:** OP was most prevalent in axial AS (42.9%), linked to high inflammatory activity (CRP: 37.2 mg/L). Peripheral SpA showed lower OP rates (17.6%), with milder inflammation (CRP: 3.3 mg/L).
- **Bone Mineral Density (BMD):** Lumbar spine and femoral neck BMD were significantly reduced in AS patients (T-score: -2.7 ± 0.3). Mixed SpA displayed intermediate BMD loss (T-score: -2.4 ± 0.4).
- **Osteoarthritic changes:** Sacroiliac joint OA was present in 100% of axial AS cases, with knee OA in 61.9%. Mixed SpA exhibited less OA progression compared to peripheral SpA, despite higher polyarthritis rates (82.3%).
- **Molecular findings:** *Chlamydia trachomatis* DNA was detected in 89.7% of synovial fluid samples, indicating pathogen persistence and its role in inflammation-induced bone and joint damage.

Conclusions:
Chlamydia trachomatis exacerbates bone health deterioration in AS, increasing the risk for osteoporosis and osteoarthritis. Early DXA screening and targeted anti-inflammatory treatments are crucial for mitigating these complications. Molecular diagnostics and imaging play essential roles in optimizing care for *Chlamydia trachomatis*-associated AS.

P814

OSTEOPOROSIS IN PATIENTS WITH AXIAL SPONDYLITIS AND INFLAMMATORY BOWEL DISEASE

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Background:
Axial spondylitis (AxS) is a chronic inflammatory condition affecting the axial skeleton, with common extra-articular manifestations, including osteoporosis (OP) and inflammatory bowel disease (IBD). Chronic inflammation and immune dysregulation in AxS contribute to systemic bone loss, making osteoporosis a significant comorbidity. Understanding the intersection of AxS, OP, and IBD is essential for improving clinical outcomes.
Objectives:
This study aimed to evaluate the prevalence of osteoporosis in AxS patients, assess its correlation with disease activity, inflammatory markers, and IBD, and explore the impact of chronic inflammation on bone mineral density (BMD).
Methods:
A prospective observational study included 257 AxS patients (ASAS criteria) over two years. Of these, 13 (5.1%) were diagnosed with IBD (Crohn's disease, ulcerative colitis, or indeterminate colitis). Comprehensive assessments included demographic, clinical, and laboratory evaluations, DXA scans for BMD, and disease activity indices (BASDAI, CRP, ESR). Statistical analysis was performed using SPSS v22.0, with $p<0.05$ indicating significance.
Results:
Osteoporosis was identified in 37.4% of AxS patients, with a higher prevalence in those with IBD (61.5% vs. 35.1%, p=0.012). Patients with IBD exhibited greater reductions in lumbar spine BMD (T-score: -2.8 ± 0.4) compared to those without IBD (T-score: -2.3 ± 0.5). Elevated CRP and ESR levels were associated with increased OP risk, reflecting the role of systemic inflammation. Disease duration correlated with OP prevalence, with rates rising from 22.5% in patients with <5 years of AxS to 49.1% in those with ≥10 years. Multivariable analysis identified IBD (OR=2.9; p=0.038) and prolonged AxS duration (OR=1.6; p=0.042) as significant predictors of OP.
Conclusions:
Osteoporosis is a prevalent and underrecognized comorbidity in AxS patients, particularly in those with concurrent IBD. Chronic inflammation and prolonged disease duration are key contributors to bone loss. These findings underscore the need for routine DXA screening and early anti-inflammatory interventions in AxS management to mitigate osteoporosis risk and improve patient outcomes. Enhanced collaboration between rheumatologists and gastroenterologists is crucial for addressing the complex interplay between AxS, IBD, and osteoporosis.

P815

OBESITY IS RELATED TO POORER FUNCTIONAL OUTCOMES AMONG INDIVIDUALS WITH RADIOGRAPHIC KNEE OSTEOARTHRITIS: FINDINGS FROM THE HERTFORDSHIRE COHORT STUDY

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Objective
Osteoarthritis is the most common joint condition, with obesity an established risk factor. Although osteoarthritis patients are advised to maintain a healthy weight, this is often challenging, especially when pain limits activity. We examined relationships between obesity and functional outcomes in older community-dwelling adults with radiographic knee osteoarthritis.
Material and Methods
We studied 101 men and 115 women, aged 71-80 years, from the UK Hertfordshire Cohort Study. Participants completed a questionnaire that ascertained information on health-related quality of life (EuroQol-5D) and pain according to the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Knee radiographs were taken and classified according to Kellgren and Lawrence (K&L) criteria; analysis was restricted to individuals with radiographic knee osteoarthritis (K&L score ≥2 on either knee). Balance, walking and chair rise scores were assigned, depending on performance, and used to derive the Guralnik physical performance score. Binary and ordinal logistic regression were used to examine obesity status in relation to functional outcomes after adjustment for age and sex.
Results
Prevalence of obesity (BMI≥30kg/m^2) was 26.7% among men and 44.3% among women. Odds of having a higher Guralnik score were lower among obese participants compared to those who were not obese ($p<0.001$). Being obese was associated with greater odds of reporting at least some problems in the following EuroQol domains compared to those who were not obese: mobility (odds ratio [95% CI]: 4.73 [2.52, 8.85], $p<0.001$); self-care (3.40 [1.44, 8.02], p=0.005); usual activities (4.38 [2.31, 8.30], $p<0.001$); and pain (2.27 [1.24, 4.15], p=0.008). Obesity was also related to increased odds of having a WOMAC pain score > 0 (2.21 [1.24, 3.95], p=0.007).
Conclusions
These findings highlight the strong relationships between obesity and functional outcomes in community-dwelling older people with radiographic knee osteoarthritis, and reinforce the need for support to achieve appropriate weight management.

P816

ASSESSMENT OF THE RISK OF VERTEBRAL FRACTURES AND THEIR INCIDENCE IN POSTMENOPAUSAL PATIENTS WITH RHEUMATOID ARTHRITIS

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Objective

The incidence of vertebral fractures and their association with the activity, duration of the disease, therapeutic modality, lifestyle, and functional impairments.

Material and methods

This is a cross-sectional analytical study that includes 150 patients with an established diagnosis of definitive RA according to the ACR (American College of Rheumatology) criteria from 1987, treated on an outpatient and inpatient basis at the University Clinic of Rheumatology in Skopje between 2019-2021. The subjects are females aged 50-80 years, postmenopausal women with a menopause duration of ≥ 2 years. We include patients who have not previously been treated with bisphosphonate therapy. All subjects with RA were treated with nonsteroidal anti-inflammatory drugs (NSAIDs) and/or disease-modifying antirheumatic drugs (DMARDs) and corticosteroids (CS).

Results

The prevalence of vertebral fractures (VF) in postmenopausal patients with RA is 54.6%. Among 58 patients, VF with grade 2 reduction is 31.3%, mild fracture is 18.0%, and severe fracture is 5.3%. In patients due to CS therapy, there is an increased occurrence of VF, smoking is one of the significant risk factors (p>0.05), along with the duration and activity of the disease, while increased BMI reduces the risk of developing these fractures. In patients with vertebral fractures, osteopenia is registered in 51.2%, normal findings in 28.0%, and osteoporosis in 19.3%. There is a statistically significant association between osteopenia and normal findings versus vertebral fractures (Pearson Chi-square: 4.0793, df=1, p=.043412), as well as between osteoporosis and normal findings versus vertebral fractures (Pearson Chi-square: 4.7127, df=1, p=.029940)

Conclusions

RA represents a risk factor for the development of osteoporosis and increases the risk of vertebral and non-vertebral fractures in postmenopausal patients with RA. This risk is proportional to the reduction in weight, duration, and activity of the disease.

P817

VERTEBRAL FRACTURES IDENTIFIED ON LATERAL DXA IMAGES USING DEEP NEURAL NETWORKS PREDICT INCIDENT FRACTURES IN OLDER WOMEN

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Objective: The aim of this study was to examine if vertebral fractures (VFs) identified on lateral DXA-images, using deep neural networks [1], predict incident fractures to a comparable degree of manually annotated vertebral fracture assessments (VFAs).

Material and Methods: 2,831 women from the SUPERB study were included in this study. VFs (mild to severe) were diagnosed from DXA by VFA or by the novel deep learning method XVFA[1]. Due to image quality, manually annotation was possible for 30,589 vertebrae, while XVFA used all visible vertebrae (n=37,123). Incident fractures were x-ray verified. Cox regression models were used to assess the association between VFs and incident fractures, with adjustments for clinical risk factors and femoral neck BMD.

Results: During 8 years of follow-up 683 and 1,310 women were identified as having any VF when analyzed manually or by XVFA, respectively. Women with any VF verified by the manual method or by XVFA had 327 (47.9%) and 539 (41.1%) any fracture, respectively. With the manual annotation method women with any VF had 70% increased risk of any fracture compared to women without VF. With the XVFA method, women with any VF had 42% increased risk of any fracture, compared to women without VF. These associations remained in adjusted models in both methods (Table 1).

Conclusion: Both methods for identification of VFs, the novel XVFA and manually annotated VFAs, predicted incident fractures.

1.V Wåhlstrand Skärström, L Johansson, J Alvén, M Lorentzon, I Häggström, *Explainable vertebral fracture analysis with uncertainty estimation using differentiable rule-based classification.* https://doi.org/10.48550/arXiv.2407.02926, 2024.

Table 1. Associations between VF identified by VFA manually or by XVFA and fracture risk in older women.

	VF identified manually		VF identified by XVFA	
	No VF n=2148	Any VF n=683	No VF n=1521	Any VF n=1310
Any fracture				
No. (%)	698 (32.5)	327 (47.9)	486 (32.0)	539 (41.1)
HR (95% CI)				
Adjusted for age, height, weight	1 [Reference]	**1.70 [1.49-1.94]**	1 [Reference]	**1.42 [1.26-1.61]**
+ clinical risk factors	1 [Reference]	**1.58 [1.38-1.81]**	1 [Reference]	**1.34 [1.18-1.52]**
+ FN BMD	1 [Reference]	**1.47 [1.29-1.68]**	1 [Reference]	**1.28 [1.13-1.45]**

Associations were examined using cox regression model. Hazard Ratios (HR) and 95% confidence intervals (CI) are presented. XVFA = explainable VFA (a model developed by deep learning).

P818

EFFICIENCY OF DENOSUMAB TREATMENT IN MEN WITH OSTEOPOROSIS

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Osteoporosis in men is gaining more and more relevance in the world, and there is a reason for this. - Every third man over 50 develops osteoporotic hip fracture. - The World Health Organization (WHO) has announced the so-called "demographic tsunami" which means an increase in the number of men over 60 in the world's population by 2050 (from 200 million in 2020 to 900 million in 2050). The latter will lead to an increase in the frequency of age-related chronic diseases, with Osteoporosis playing a leading role among them.

The problem of osteoporosis in men is also determined by their infrequent referral to a doctor, infrequent diagnosis and the absence of "men's anti-osteoporosis treatment guidelines", which the IOF rightly calls "discrimination". - Based on the above, we do not have sound medical evidence about the effectiveness of anti-osteoporosis drugs in men.

In the presented work, we aimed to study the effectiveness of denosumab (Prolia) treatment in men with osteoporosis. Treatment was given to 250 men diagnosed with osteoporosis, in which 2 age groups were represented. Group 1 (110 patients aged 35-55), Group 2 (aged 60-80). Patients were diagnosed using a dual-energy X-ray absorption densitometer (Lunar Prodigy) – (T and Z score). Denosumab treatment lasted 3 years - 60 mg The drug was administered subcutaneously once every 6 months. The dynamics of the indicators in the treatment process are given in the table:

Indicators	Group 1 Patient N#92 (T-score)	Group 2 Patient N#100 (T-score)
Before treatment	-3.1+-0.015	-2.9+-0.015
After treatment	-2.6+-0.16	-2.9+-0.15
Beeief	P<0.001	P<0.05

Results:

- Studies have shown that the average number of BMD in a group of young men is lower than in older patients.
- The effect of treatment with denosumab in the 1st group of subjects (35-55) is significantly higher than in older patients.
- No serious side effects were detected during treatment.
- The use of denosumab in men with osteoporosis is characterized by high efficacy and a high safety index

P819

25(OH)D LEVEL AND PREVALENCE OF RISK FACTORS FOR VITAMIN D DEFICIENCY/ INSUFFICIENCY

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Objective: To assess the level of 25(OH)D in blood plasma and the prevalence of risk factors for the development of vitamin D deficiency/insufficiency.

Materials and methods: A total of 60 patients were examined, the average age was 57 (38; 65) years, of which 31.7% (n=19) were men and 68.3% (n=41) were women. The level of 25(OH)D in plasma was determined by the enzyme immunoassay. A questionnaire survey method was used to identify risk factors for vitamin D deficiency/insufficiency: exposure to sunlight in the summer months and / or visits to the solarium, the use of sunscreens, intake of vitamin D-containing drugs, consumption of products containing vitamin D, omega-3 fatty acids, calcium. Statistical processing of the obtained results was carried out using the program “STATISTICA 10.0”.

Results: The level of 25(OH)D in the blood plasma of patients averaged 17.6 (13.7; 22.2) ng/ml, and was optimal in 9,2% of the examined subjects, 25(OH)D insufficiency was revealed in 28,8% and deficiency in 62% of the subjects. The 25(OH)D level in the blood plasma of women was 17.6 (13.7; 22.4) ng/ml, while in men it was – 17.2 (14.3; 20.2) ng/ml, no differences were found between the examined patients (p> 0.05).

The results of the questionnaire revealed low adherence to tanning among the subjects, amounting to 83.4%, non-visitation of solarium – 100%, insufficient intake of preparations containing vitamin D – 60% and calcium with vitamin D – 76.7% in both sexes, no differences were found (p>0.05). Men intake of preparations containing vitamin D less often (p£0.05), compared to women (10,5% versus 53,7%, respectively).

Conclusion: A high prevalence of risk factors for vitamin D deficiency/insufficiency as well as 25(OH)D level in blood plasma was revealed, which amounted to 83,4% and 90,8%, respectively.

P820

PHYSICIANS’ MANAGEMENT APPROACH TOWARDS PATIENTS WITH NON-TRAUMATIC MUSCULOSKELETAL COMPLAINTS

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Objective

To describe physicians’ management approach towards patients who consult for non- traumatic musculoskeletal complaints.

Methods
We performed a cross-sectional survey from September 2023 until January 2024 using Google Forms, including physicians of several specialties. We did not include rheumatologists and non-clinical specialists. We collected data on the socio-demographic background of medical doctors and those regarding their diagnostic and therapeutic approach towards patients with non-traumatic musculoskeletal complaints.

Results
A total of 105 physicians participated in the survey. Most of them were females (80%). The mean age was 30.2±3.4 years.
Mean clinical experience was 4±2.1 years. Training in rheumatology during medical studies was performed by 63% of the physicians, with a mean duration of 2.5±1.5 months [0.5-6 months]. In their daily practice, 40% of the physicians saw fewer than 5 patients per week with non-traumatic musculoskeletal complaints, 30.5% saw 5 to 10, 10.5% saw 10 to 20, and 12.4% saw more than 20 patients per week.
Physicians requested complementary exams in the following cases: inflammatory osteoarticular pain in 42.9% of the cases (n=45), intense pain in 29.5% of the cases (n=31), resistance to treatment in 41% of the cases (n=43), presence of associated general symptoms in 41.9% of the cases (n=44), if the patient had multiple pain sites in 14.3% of the cases (n=15), and only if a medical emergency was suspected in 1% of the cases (n=1). Six physicians (5.7%) requested complementary exams for every patient and 29.5% did not request any tests and referred the patient to a rheumatologist (n=31).
As for therapeutic approaches, 68.6% of physicians always prescribed symptomatic treatment to relieve pain (n=72), 10.5% only prescribed treatment after tests' results (n=11), and 26.7% did not prescribe treatment and referred the patient to a rheumatologist (n=28).
The prescribed treatments depending on whether the complaint was mechanical or inflammatory are detailed in **Table 1**.
Table 1: Prescribed treatments in mechanical and inflammatory musculoskeletal pain

	Mechanical musculoskeletal pain	Inflammatory musculoskeletal pain
Acetaminophen	87.6% (n=92)	74.3% (n=78)
Weak opioids	19% (n=20)	21% (n=22)
Non-steroidal anti-inflammatory drugs	43.8% (n=46)	58.1% (n=61)
Corticosteroids	1.9% (n=2)	7.6% (n=8)
Muscle relaxants	23.8% (n=25)	6.7% (n=7)
Phytotherapy	5.6% (n=6)	3.8% (n=4)
Icing	28.6% (n=30)	35.2% (n=37)
Topical analgesics	51.8% (n=61)	64.8% (n=68)

Conclusion
Our study noted that most of non-rheumatologist physicians consistently prescribed symptomatic treatment for pain relief in patients with non-traumatic musculoskeletal complaints. They were motivated to run diagnostic tests especially in case of inflammatory pain, resistance to treatments, or in presence of associated general symptoms.

P821

APPROACHES TO URATE-LOWERING TREATMENT IN MULTIMORBID PATIENTS WITH EARLY GOUT

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Introduction. Patients with gout and hyperuricemia have an increased number of comorbid diseases, compared to population level, which may affect the efficacy and safety of urate-lowering therapy (ULT).
Objective. To determine the frequency of comorbid pathology in multimorbid patients with early gout, the effecy and safety of ULT (allopurinol,febuxostat).
Materials and methods. The study was conducted in Kyiv and Kyiv region in 2024., involved patients who were diagnosed with gout for the first time, consulting by GP/traumatologist/rheumatologist, with joint pain syndrome duration for up to 3 months. All patients underwent a comprehensive clinical, laboratory and instrumental examinations; retrospective analysis of medical records was done also to identify comorbid pathologies. Patients who had already started urate-lowering treatment (ULT), had GFR <60 ml/min, ALT and/or AST >3 ULN at the initial examination, had secondary hyperuricemia were not enrolled. After signing the informed consent, patients were prescribed ULT - either allopurinol or febuxostat with subsequent dose titration as needed. Assessment of the effecacy and safety of ULT was performed at 1, 3, and 6 months visits.
Results. The study included 112 patients (aged 37-62 years, women – 18.69%). Comorbid diseases/pathologies were detected in all patients (64.08% - diagnosed with arterial hypertension, 63.19% - dyslipidemia, 61.4% - overweight/obesity, 54.29% - MAFLD; 52.51% - osteoarthritis, 36.49% - gastrointestinal diseases, 34.71% - GFR 60-89 ml/min., 18.69% - CHD, 15.13% prediabetes/T2DM, 15.13% - nephrolithiasis; other pathology - 10.68%). The average number of established comorbid pathologies in 1 patient was 4.1±1.02, most patients received/needed their pharmacologic treatment. Analysis of the efficacy and safety of allopurinol and febuxostat over the next 6 months showed higher efficacy (in terms of speed and stability of achieving target serum uric acide (UA) level) in febuxostat group with the same level of registered adverse events in both groups. The most frequently registered AE was an increase in the level of ALT and/or AST, which was associated with a greater number of comorbid diseases and the presence of MAFLD.
Conclusions. In multimorbid patients with early gout febuxostat demonstrates higher efficacy in achieving target serum UA levels compared to allopurinol. Increased ALT and AST levels during ULT are associated with higher comorbidities index and MAFLD.

P822

METHOD FOR INCREASING THE ULTRASONIC CONDUCTIVITY OF SKULL BONE TISSUE IN PATIENTS WHO ARE PLANNED TO BE TREATED WITH MAGNETIC RESONANCE IMAGING-GUIDED FOCUSED ULTRASONIC IMAGING

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The invention relates to medicine, namely to endocrinology and neurosurgery, and can be used to treat patients with altered ultrasound conductivity of bone tissue who are planned to be treated with magnetic resonance imaging-guided focused ultrasound (MR-FUS) The MR-FUS method is most often used to treat movement disorders such as Parkinson's disease, dystonia, and essential tremor. This method is an aid to standard neurosurgical interventions, primarily due to its non-invasiveness [Elias WJ et al., 2016; [Leinenga G. et al., 2016]. The method is based on two technologies – high-intensity focused ultrasound (HIFU) and MRI. Using heating or cavitation at a variable distance from the sensor, HIFU can cause selective thermal coagulation in a clearly defined volume [Chang W. 2016]. The error in the destruction of brain tissue with this method is extremely small and averages 0.50–0.75 mm, varying depending on the technical characteristics of the selected equipment. Skull density ratio (SDR) is the ratio between the average Hounsfield units of bone marrow and cortical bone, affecting energy transmission through the skull. Skull bone tissue affects the distortion of the trajectory of acoustic waves in the brain. The velocity of each ultrasound beam varies differently depending on its path through the skull. This results in ultrasound waves not constructively converging at the focus, changing the shape or location of the focus. These phase aberrations are currently clinically corrected using computed tomography (CT) images to calculate delays from individual transducer elements based on the geometry of the imaged skull and estimates of the speed of sound ratios in Hounsfield units (HU) [U. Vyas et al., 2016]. Skull density is then calculated and, depending on it, starting points are individually selected for calibration of MR-FUS helmets. It follows that one of the limitations for performing MR-FUS is the density of the skull bone tissue, which is expressed by the coefficient of ultrasound conductivity of bone tissue (CUBT) less than 0.35. According to various authors, the empirical criterion of CUBT for thalamotomy in MR-FUS is 0.35 [Wang TR. et al., 2018, Chang WS. et al., 2019]. The arsenal of solutions to the problem associated with low CUPT is very limited, which in turn leads to numerous refusals to perform operations using focused ultrasound. The closest analogue of the invention is a method for treating patients with a reduced ultrasound conductivity coefficient of the skull bone tissue using an oral form of a bisphosphonate, namely alendronic acid (Alendronate) at a dose of 35 mg once a week for 3-9 months, described by the Japanese in 2019 [Yamamoto K. et al. The Efficacy of Bisphosphonate to Increase the Skull Density Ratio of MRI-guided Focused Ultrasound Candidates with Brain Disorders //ARCHIVOS DE MEDICINA. - 2019. - Vol. 10. - No. 2. – P. 293. (PDF) Efficacy of a bisphosphonate for increasing the skull density coefficient in candidates for MRI-guided focused ultrasound examination with brain diseases (researchgate.net)]. The disadvantages of the prototype include the following: a longer preparation period for MR-FUS, lower efficiency in the form of reduced absorption from the gastrointestinal tract, poor tolerability, lower adherence to the therapy, an increase in the cost of using the drug once a week, concomitant therapy is not reflected, which is regarded as its absence. The objective of the invention is to develop a method for increasing the ultrasound conductivity of the bone tissue of the skull for further surgical interventions in patients using MR-FUS in a short time and with a safer method. The technical result of using the invention is a significant increase in the skull UCCT in patients with an initial UCCT of less than 0.35, achieving the threshold value necessary for thalamotomy with MR-FUS.

The proposed method for increasing the ultrasound conductivity of the cranial bone tissue is carried out as follows. The patient for whom MR-FUS is planned undergoes CT of the cranial bones to determine the UPCCT, as well as laboratory tests for ionized calcium and vitamin D. If the coefficient is less than 0.35, the patient is administered Bonviva (Ibandronic acid) 3 mg intravenously by bolus over 15-30 seconds once every 3 months, Aquadetrim (Cholecalciferol) at a dose of 1500-5500 IU per day and Calcium D3 Nycomed (Calcium carbonate + Cholecalciferol) at a dose of 500 mg + 200 IU 2 times a day. The course of treatment is 3-6 months. After 3 months, the patient undergoes a repeat CT of the cranial bones on the same device and with the same program to assess the ultrasound conductivity coefficient of bone tissue, and laboratory tests for vitamin D and ionized calcium. If the cranial CUPCT increases by more than 0.35, the patient is referred for surgery using focused ultrasound. If there is no effect after 3 months, treatment is continued for up to 6 months. The drug Bonviva (Ibandronic acid) is actively used in the treatment of various forms of osteoporosis. The mechanism of action of Bonviva does not disrupt the mineralization of bone tissue when prescribed in therapeutic doses for the treatment of osteoporosis and does not affect the process of replenishment of the osteoclast pool. The selective effect of Bonviva (ibandronic acid) on bone tissue is due to its high affinity for hydroxyapatite, which makes up the mineral matrix of bone. It dose-dependently inhibits bone resorption and does not directly affect the formation of bone tissue. Reduces the increased rate of bone turnover, which leads to an overall progressive increase in bone mass, a decrease in bone collagen breakdown indices (concentrations of deoxypyridinoline and cross-linked C- and N-telopeptides of type I collagen) in urine and serum, the incidence of fractures and an increase in bone mineral density (BMD).

Three surfaces are responsible for the processes of ultrasound wave reflection (during MR-FUS): the outer and inner plates and the bone marrow itself. During therapy with Bonviva (Ibandronic acid), the porosity of the skull bone tissue, mainly the cortical layer, decreases due to an increase in the degree and homogeneity of bone matrix mineralization. A decrease in porosity leads to an increase in ultrasound conduc-

tivity and the removal of one of the limitations for MR-FUS. According to International and Russian guidelines for the treatment of osteoporosis, the optimal therapeutic dosage of Bonviva (ibandronic acid) is 3 mg 3 ml in a syringe, which is administered intravenously for 15-30 seconds at a frequency of 1 time in 3 months [J Orthop Surg Res. July 9, 2024; RCT 2021]. Using the proposed method, 7 patients with CUPT less than 0.35 were treated. The average age of patients was 54.5±13.5 years. During the therapy, an increase in the KUPCT was revealed in patients (Table 1).

Table 1

Changes in the ultrasound conductivity coefficient of bone tissue during therapy

№ Full name Age Gender UPC before therapy UPC after therapy

1. Ch.O.G. 61 F 0.34 0.41
2. S.I.A. 51 M 0.34 0.38
3. M.E.A 41 M 0.30 0.41
4. K.A.M. 54 M 0.34 0.42
5. B.H.S. 66 M 0.33 0.41
6. P.A.V 60 M 0.31 0.38
7. P.N.M. 68 M 0.32 0.43

The differences in the KUPCT before and after therapy using the proposed method were statistically significant (Table 2).

Table 2

Average KUPCT values before and after the therapy

KUPCT before therapy KUPCT after therapy P

m±s 0.32±0.025 0.40±0.057 <0.0001

Thus, it follows from the presented data that as a result of the therapy using the claimed method, it was possible to achieve the threshold value necessary for performing thalamotomy with MR-FUS.

The essence of the invention is explained by the following examples.

Example 1. Patient M.E.A., 41 years old, with the main diagnosis: torsion dystonia, characterized by abnormal muscle contractions in the right leg, both arms (more than the right) and neck. The patient underwent CT of the skull bones, which showed low bone density of the skull: CT-CT 0.30. The patient's plasma vitamin D level was 17 ng / ml, ionized calcium 1.17 mmol / l. By decision of the endocrinologist and neurosurgeon, after additional examination and exclusion of contraindications, treatment was prescribed according to the proposed method: Bonviva (ibandronic acid) 3 mg intravenously bolus for 15-30 seconds once every 3 months, Aquadetrim at a dose of 5000 IU per day and Calcium D3 Nycomed at a dose of 500 mg + 200 IU 2 times a day, the course of treatment was 3 months. After 90 days of therapy, a repeat computed tomography of the skull bones was performed, the CCT was 0.41, the plasma vitamin D level was 43 pg/ml, ionized calcium 1.14 mmol/l, which would have allowed this patient to undergo the planned surgical intervention, which he did not attend due to personal circumstances.

Example 2. Patient Ch.O.G., 61 years old, with the main diagnosis: Essential tremor, a family case, involving the upper limbs and head. Severe impairment of social and everyday adaptation. The patient underwent CT of the skull bones, which showed low density of the skull bones: KUPCT 0.34. The plasma vitamin D level in this patient was 45 ng/ml, ionized calcium 1.14 mmol/l. By decision of the multidisciplinary team (endocrinologist, neurosurgeon, neurologist and cardiologist), after additional examination and exclusion of contraindications, treatment was prescribed according to the proposed method: Bonviva (ibandronic acid) 3 mg intravenously bolus over 15-30 seconds once every 3 months, Aquadetrim at a dose of 1500 IU per day and Calcium D3 Nycomed at a dose of 500 mg + 200 IU 2 times a day, the course of treatment was 4.5 months. After 90 days of therapy, the patient was unable to undergo a repeat CT scan of the skull bones (due to personal circumstances), which was ultimately performed 1.5 months later than stated, that is, 4.5 months after the start of treatment. After 135 days of therapy, a repeat CT scan of the cranial bones was performed, the CT scan was 0.41, the plasma vitamin D level was 56 pg/ml, and ionized calcium was 1.12 mmol/l, which allowed this patient to undergo the planned surgical intervention, namely, unilateral noninvasive thalamotomy of the ventral intermediate nucleus of the thalamus on the left using focused ultrasound under MRI control. After the surgery, almost complete regression of neurological symptoms caused by the underlying disease was noted, which significantly affected the patient's quality of life.

Example 3. Patient P.N.M., 68 years old, with the main diagnosis: Parkinson's disease, rigid-tremor form, mainly in the right limbs, stage 3 according to Hen Yar. The patient underwent CT of the cranial bones, which noted low bone density of the cranial bones: CT scan 0.31. The plasma vitamin D level in this patient was 10 ng/ml, ionized calcium 1.19 mmol/l. By decision of the multidisciplinary team (endocrinologist, neurosurgeon, neurologist and cardiologist), after additional examination and exclusion of contraindications, treatment was prescribed according to the proposed method: Bonviva (ibandronic acid) 3 mg intravenously bolus over 15-30 seconds once every 3 months, Aquadetrim at a dose of 5500 IU per day and Calcium D3 Nycomed at a dose of 500 mg + 200 IU 2 times a day, the course of treatment was 6 months. Three months after the CT scan, the required CTUCCT of 0.34 was not achieved, so the early treatment was continued, and after another three months of therapy, a repeat CT scan of the skull bones was performed, the CTUCCT was 0.43, the plasma vitamin D level was 47 pg/ml, ionized calcium 1.15 mmol/l. Then the patient underwent surgery - non-invasive thalamotomy with focused ultrasound under MRI control. Follow-up observation of the patient demonstrates regression of the neurological manifestations of the underlying disease.

P823

ROLE OF NAIL BED CAPILLAROSCOPY IN PATIENTS WITH UNDIFFERENTIATED ARTHRITIS AND RAYNAUD'S PHENOMENON

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Objective: Undifferentiated arthritis (UDA) is arthritis (oligo-, polyarthritis) in which the criteria of any specific disease are not met

at the present time. Excessive spastic reaction of digital arteries and cutaneous vessels against the background of the Raynaud's phenomenon (RP) when exposed to cold or emotional stress. RP has two variants: primary and secondary. Primary RP occurs in 90% of cases and is not a sign of a serious disease. Secondary RP is one of the manifestations of systemic autoimmune pathology, most often systemic sclerosis (SSc), but can also occur in other systemic connective tissue disorders (SCTD) such as systemic lupus erythematosus, rheumatoid arthritis, mixed connective tissue disease (MCTD) and others. Nail bed capillaroscopy (NBC) is a study of the nail fold or capillary bed and vascular circulation using a special device - a capillaroscope, which has a device for fixing the finger and a light source. NBC is a safe and non-invasive method for differential diagnosis of primary and secondary RP. According to this, the aim of the study is the capillaroscopic picture in patients with UDA in combination with RP.

Methods: A total of 33 patients with UDA in combination with risk factors were examined: 25 women (75.7%) and 8 men (24.3%) aged 25 to 40 years (mean age 30.4 ± 4.6 years), average duration of arthritis 3.7 ± 2.3 months. Anamnesis, examination and complete clinical examination of patients were performed. All patients had arthritis in at least 1 joint, which was verified by ultrasound examination of the joints. All patients underwent NBC, laboratory and immunological studies (immunoblot to determine the spectrum of autoantibodies).

Results: Primary risk factors were detected in 21 patients (63.6%), including 16 women and 5 men. Secondary risk factors were detected in 12 patients (36.4%), in 9 women and 3 men. Of these, scleroderma changes were detected in 9 patients (27.3%) (6 women and 3 men), and connective tissue disease (CTD) in 3 (9.1%) patients. NBC together with immunological diagnostics allowed us to establish the diagnosis of one or another CTD in 11 patients for the first time.

Conclusion: NBC can significantly help in the diagnosis and differential diagnosis of patients with NDA in combination with FR. NBC is the "gold standard" in the diagnosis of patients with RP.

P824

ASSESSMENT OF THE CONTRIBUTION OF URATE-LOWING THERAPY TO THE CORRECTION OF METABOLIC AND LIPID DISORDERS IN HYPERURICEMIA

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Objective: The association of hyperuricemia (HU) with metabolic and cardiovascular disorders has been well studied and proven. The positive effect of urate-lowering therapy on blood pressure, pathological remodeling of the heart, endothelial function, kidneys and a number of other positive effects have been determined for patients with gout. However, the feasibility of prescribing uricostatics to patients with asymptomatic HU (AHU) is not so obvious and continues to be studied. The purpose of the study: to assess the contribution of urate-lowering therapy to limiting the progression of metabolic and lipid disorders in patients with purine metabolism disorders.

Methods: A retrospective analysis of data from 37 of 406 initially selected medical records of patients was performed, followed by statistical processing of the data (STATISTICA 12). The selection criteria were: the presence of GU confirmed during 3 or more hospitalizations over 4 years (2020 – 2024).

Results: The study group consisted of 18 patients with AGU and 19 patients with gout (mean age 67.8 ± 13.8 years). Men predominated in both subgroups and had significantly higher uric acid (UA) levels ($p < 0.001$). AGU was 2.6 times more common in men, and gout 5.3 times more common than in women. In patients with gout, the absolute values of UA levels by year were subject to significant fluctuations due to irregular uricostatic therapy, which was received by 16 of 19 patients. The target uric acid level according to hospital records was achieved in only one case. In the subgroup with AGU, uricostatic therapy was not prescribed. The initial (2017) uricemia indicators and the degree of its severity did not have reliable differences in the AGU and gout subgroups. By 2020, an increase in the severity of GU was noted in both subgroups, however, with AGU, the increase in uricemia was almost 2 times higher than in the gout subgroup ($p < 0.05$). The average values of TC, LDL and TG in the subgroup with AGU did not undergo significant changes over 4 years, while in the subgroup of patients with gout there was a reliable decrease in all three indicators ($p < 0.05$). With an initial blood glucose level without reliable differences between the subgroups, after 4 years a statistically significant increase was determined with AGU ($p < 0.001$). In the gout subgroup, the glycemia level did not differ significantly from the 2017 values. Of the associated pathologies, the most frequently noted were kidney damage (AGU n = 9 (50%), gout n = 13 (68%)), hypertension and obesity. Evaluation of the treatment of patients with gout and AGU from the standpoint of prescribing drugs with a potential effect on purine metabolism did not demonstrate significant differences in the subgroups, which made it possible to consider the above reliable differences with a high probability as the effect of uricostatic therapy.

Conclusion: For patients with persistent purine metabolism disorder, regardless of the presence or absence of gout symptoms, HU progression over time and a wide range of associated pathology are characteristic. Uricostatic therapy in the subgroup of patients with gout demonstrated not only a positive effect on limiting the increase in uricemia, but also had a reliable synergistic effect on the correction of lipid and carbohydrate metabolism, in contrast to patients with AGU without the appointment of uricostatics. Positive effects were determined even without achieving target values of UA and atherogenic lipids. In the future, it is planned to expand the study group using multivariate analysis to clarify the presented data.

P825

CORRELATION OF EFFECTIVENESS OF ANTI-OSTEOPOROSIS TREATMENT WITH D - HORMONE INDICATORS IN PERIPHERAL BLOOD

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We live in an era of vitamin D3 hormone deficiency. A large part of the population, especially women, often without a diagnosis and a doctor's recommendation, arbitrarily take vitamin D3 treatment. The world medical community has long agreed that vitamin D3 is directly involved in the process of bone formation. D3 medicinal forms have been created in the form of pills, and injections, with different doses - although many questions remain unanswered:
- Does the amount of vitamin D3 in the blood affect the development of osteoporosis?
- Does the dose of vitamin D3, and the duration of administration affect the course of osteoporosis and, most importantly, the effectiveness of anti-osteoporosis treatment?
Here, we tried to offer answers to these questions. 65 female patients aged 38-70 were under observation. Osteoporosis was diagnosed by dual energy absorption densitometry (Lunar Prodigy) using T and Z-score. Quantitative research on vitamin D3 was done in the blood of all patients before treatment and every 6 months. Treatment of patients lasted for 2 years. All patients with postmenopausal osteoporosis received zoledronic acid (60 mg) once a year - intravenously for two years.
Two groups of women suffering from postmenopausal osteoporosis were separated according to vitamin D3 levels. Group 1 (35 patients) - whose D3 level was < 30 ng/l. Group 2 (30 patients - vitamin D3 levels below 20ng/L.) In patients of both groups, treatment was started in October 2022- (first injection) The 2nd injection was given intravenously in October 2024
Results:
1. Patients of the first group received 4000-10000 IU of vitamin D3 along with anti-osteoporosis treatment. - once a day (according to the vitamin D3 index).
2. Subjects in the second group of patients received 10,000-20,000 IU according to their vitamin D3 levels. 1 tablet of vitamin D3 per day (with control once every 6 months).

- 67% of women with postmenopausal osteoporosis in the study have vitamin D3 deficiency.
- No correlation was found between low levels of vitamin D3 and the incidence of vertebral fractures. The increase in BMD indicators (T-score) was expressed in the 2nd group of patients where there were significantly reduced parameters of vitamin D3 and received high doses of vitamin D3.
- It is likely that the effectiveness of antiresorptive treatment is related to the doses and duration of vitamin D3 received.

P826

A MULTI-BIOMARKER COMPRISING FECAL CALPROTECTIN (FCPT), BRAIN-DERIVED NEUROTROPHIC FACTOR (BDNF), FIBROBLAST-GROWTH FACTOR-21 (FGF-21) AND IRISIN OUTPERFORMS SINGLE BIOMARKERS IN THE DIAGNOSIS OF SARCOPENIA IN COMMUNITY-DWELLING PERSONS

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Objectives: This study aimed to develop a sarcopenia biomarker in community-dwelling persons (≥ 65 years) reflecting gut and non-gut related factors underlying its etiology. Materials and methods: This exploratory, cross-sectional study includes 156 older adults (53♂/103♀, median age 73 years) of whom 59 have EWGSOP2-defined sarcopenia. Serum myokines (irisin, myostatin, IGF-1, FGF-21 and BDNF) and the intestinal inflammatory marker fCPT were determined via ELISA. Muscle mass and function were evaluated by appendicular lean mass, handgrip strength, 5-time chair stand time (CST), gait speed and the Short Physical Performance Battery (SPPB). Correlations (Spearman; point-biserial, ρ), multivariate linear and logistic regressions were calculated for associations between sarcopenia, muscle mass, function and biomarkers. Receiver operating characteristics of Areas Under the Curve (AUC) were determined for diagnostic accuracy. Significance was set at $p<0.05$. Results: BDNF was lower in persons with sarcopenia ($p = 0.008$), correlated negatively with sarcopenia ($p = 0.004$) and significantly decreased the odds of sarcopenia (OR:0.99; 95% CI (0.99989;0.99999)) after adjusting for age and sex. fCPT associated positively with 5-time CST after correcting for age and sex ($p = 0.022$), implying that higher intestinal inflammation was associated with worse lower limb strength. Persons with low intestinal inflammation (fCPT < 50 µg/g) walked faster than those with high intestinal inflammation (fCPT ≥ 200 µg/g) ($p = 0.006$). BDNF (AUC:0.63; sensitivity 53%; specificity 71%) significantly diagnosed sarcopenia in the entire cohort. Only in men, additionally to BDNF, fCPT (AUC:0.77; sensitivity 100%; specificity 48%) diagnosed sarcopenia. A multi-biomarker with fCPT, BDNF, irisin and FGF-21 (AUC:0.71; sensitivity 64%; specificity 58%) outperformed myostatin ($p = 0.011$), irisin ($p = 0.037$), IGF-1 ($p = 0.024$) and FGF-21 ($p = 0.042$) alone, but not BDNF ($p = 0.3327$) or fCPT ($p = 0.1843$) in sarcopenia diagnosis. Conclusions: BDNF lowers the OR of sarcopenia, although with limited clinical relevance. A multi-biomarker panel sig-

nificantly outperforms specific single markers to detect sarcopenia. These findings warrant further investigation in larger cohorts, assessing additional (non-)myokine markers to identify the 'optimal' multi-biomarker in diagnosis of sarcopenia. Disclosures: The authors declared no competing interests.

P827

EFFECT OF GUT MICROBIOTA ALTERING INTERVENTIONS ON SARCOPENIA OR ITS DEFINING PARAMETERS IN OLDER ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Objectives: We aimed to investigate effects of gut microbiota (GM) altering interventions to assess their therapeutic potential on sarcopenia or its parameters (muscle strength, mass and physical performance). Interventions of interest were diets, prebiotics (non-digestible foods promoting bacterial growth), probiotics (supplementation with live bacteria) or synbiotics (a combination of the latter two). Materials and methods: A protocol was preregistered on PROSPERO (CRD42022347363). Six databases and one registry were searched. Mono-interventions on diet, pre-, pro or synbiotics in populations of mean age ≥50 years were included. Standardized mean differences (SMD) and 95% confidence (CI) were computed using a randomized-effects model if heterogeneity was > 50%. Sensitivity and meta-regression analyses were performed to identify sources of heterogeneity and potential modulators, respectively. Risk of bias (RoB) 2 and Risk Of Bias In Non-randomized Studies (ROBINS)-I tools were used to assess randomized and non-randomized interventions respectively. Results: 51 studies were included in the qualitative analysis, of which 30 were on several diets, 11 on prebiotics, 9 on probiotics and one on synbiotics, totaling 4205 participants (58% ♀). 44 and 7 studies were at high and moderate RoB, respectively. Of 51 studies, 33 were included in the quantitative analysis. Probiotics (SMD: 0.68; 95% CI [0.30; 1.06]) and increased intake of fruits and vegetables significantly improved muscle strength (SMD: 0.88; 95% CI [0.38; 1.37]). The former intervention also improved physical performance (SMD: 0.69; 95% CI [0.41; 0.96]). Additionally, energy-restricted high-protein diets improved physical performance estimates (SMD: 0.77; 95% CI[0.01; 1.52]). However, when for one study the physical performance test was replaced by gait speed test, findings were no longer significant. Conclusions: Increased fruits and vegetables intake and probiotics improve muscle strength. Also, the latter intervention and energy-restricted high-protein diets improve physical performance. Included studies were heterogeneous in terms of study duration, included population and tools used to assess sarcopenia (parameters). Further investigation in more uniformly designed longitudinal studies is warranted to estimate the effect of GM altering interventions on sarcopenia. Disclosures: The authors declared no competing interests.

P828

EVALUATION OF THE EFFECTIVENESS OF COMPLEX IMPACT OF SHOCKWAVE THERAPY AND PULSED LOW-FREQUENCY ELECTROSTATIC FIELD IN SANATORIUM TREATMENT OF PATIENTS WITH CHRONIC SHOULDER PAIN

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Introduction. The relevance of the study is due to the widespread prevalence of chronic pain in the shoulder joint, including among people of working age, as well as the insufficient effectiveness of standard therapy for patients with degenerative-dystrophic joint diseases.

Objective: development and scientific substantiation of a new complex physiotherapeutic method for treating patients with chronic pain in the shoulder joint, increasing the effectiveness of spa treatment in this category of patients.

Methods. The study was conducted in a comparative aspect on three randomized groups of patients with chronic shoulder pain (30 people in each). In the 1st group, standard spa treatment was carried out, in the 2nd group, patients additionally received 3 procedures of shock wave therapy (SWT) once a week, in the 3rd group, in addition to SWT, patients additionally received 8 effects of a pulsed low-frequency electrostatic field (PLFEF). The results were assessed before treatment and on the 15th day of spa treatment.

Results. In the compared groups, statistically significant changes in the Swanson activity index were found after treatment, with an advantage in the main group ($p<0.001$). When analyzing the amplitude of extension and flexion in the shoulder joint before treatment, it was not possible to establish statistically significant differences between the groups ($p>0.05$). After treatment, a reliable significant dynamics of both of these indicators was noted in all three groups ($p<0.001$), but after treatment, significant intergroup differences in these indicators were revealed: in the main and control groups they were better than in the comparison group ($p<0.001$). When assessing the pain index according to the ICF after treatment, significant differences were found compared with the initial level in all three groups ($p<0.001$), but the pain level was lower than in the comparison group ($p=0.031$).

Conclusion. The combined effect of SWT and PLFEF against the background of basic spa treatment in patients with chronic pain

in the shoulder joint contributes to a more significant analgesic effect, an increase in the range of active movements in the shoulder joint and an increase in the patient's activity level in everyday life compared to standard spa treatment.

P829

THE EFFECTIVENESS OF VIRTUAL REALITY AND MECHANOTHERAPY TECHNOLOGIES IN THE REHABILITATION OF PATIENTS AFTER SURGICAL TREATMENT OF HIP FRACTURES AGAINST THE BACKGROUND OF OSTEOPOROSIS

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Background. The primary goal of rehabilitation measures after hip fracture surgery against the background of osteoporosis is to reduce the likelihood of disability and death, which is highest in the first months after the hip fracture.
Objective. To develop, scientifically justify, and study the effectiveness of virtual reality and mechanotherapy technologies in the rehabilitation of patients after surgical treatment of hip fractures against the background of osteoporosis.
Methods. The study included a total of 98 patients aged 59 to 84 years who underwent osteosynthesis or hip joint replacement due to osteoporotic hip fractures within 6 to 12 weeks before inclusion in the study.
Results. The study results indicate that the new medical rehabilitation complex contributes to an increase in the total Harris score (p=0.034) and maximum hip extension strength (p=0.041) after 12 days, improvement in walking speed and biomechanics - increasing the step length of the right leg after 12 days (p=0.036) and reducing step width after 60 days (p=0.22), rapid regression of pain syndrome, and improved physical functioning.
Conclusion. In patients with osteoporosis who have undergone surgical treatment for proximal femoral fractures, the new medical rehabilitation complex with mechanotherapy technologies, virtual reality, and training on a sensory treadmill with biofeedback function, compared to the standard rehabilitation complex, contributes to a shorter recovery time for hip joint function.

P830

THE EFFICACY OF LONG-TERM TREATMENT WITH CALCIMIMETICS OF CKD PATIENTS ON HEMODIALYSIS WITH SECONDARY HYPERPARATHYROIDISM

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Objective. Despite much is known about mineral and bone disorders (MBD) in chronic kidney disease (CKD), the treatment of such patients remains a difficult clinical problem. The aim of the study was to evaluate the effect of long-term calcimimetic therapy (LTCT) of secondary hyperthyroidism (SHPT) in CKD patients on hemodialysis.
Materials and methods. A single-center prospective cohort study included 46 patients CKD 5D stage receiving hemodialysis treatment at least 3 months. We examined were 25 (54.3%) men and 21 (45.7 %) women, aged 55.25 ± 13.34 years. All patients received standard treatment with phosphate binders, active metabolites of vitamin D in individual doses to achieve target levels of Ca and P. 30 patients in group of LTCT received additionally cinacalcet in individual dose 30-90 mg according to iPTH level up to two years. Results obtained in group of LTCT treatment were compared with those on standard therapy – 16 oatients. Laboratory assessments included analysis of iPTH, alkaline phosphatase (AP), serum Ca and P before and after one and two years of therapy. Statistical data were obtained by usage of SPSS program, v. 21 with statistical significance determined at the level of p <0.05.
Results. In patients with SHPT who received LTCT treatment significant decrease of iPTH level took place after 1 year of treatment compared to starting level. (p=0.031) After 2 years of cinacalcet therapy this process became more prominent (p<0.0001). In group of standard background therapy after1 and 2 years there was not significant changes in iPTH level compared to starting levels (p>0.05) . Simultaneously it was established significant decrease of P (p=0.0001); Ca (p=0.001) after 1 year, and after 2 years (p=0.0001) of LTCT ; and significant decrease of ALP (p=0.001) only after 2 years of long-term use of cinacalcet. In group of LTCT target levels of iPTH according to KDIGO 2017 recommendations were achieved in 80.0% of patients with SHPT. It was accompanied by a significant decrease in the frequency of fractures which did not occurred during 2 years in group of LTCT compared with group of standard treatment showing incidence of hip fracture in 4 (25 %) during 2 years. There were no side effect of long term cinacalcet therapy during 2 year period.
Conclusions. Long-term therapy of SHPT with calcimimetics showed safety and a significant decrease in iPTH, accompanied by a decrease of P, Ca, AP levels, and prevention of hip fracture during 2 years.

P831

THE EXPEDIENCY OF ONLINE EDUCATION FOR PATIENTS WITH GOUT

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Objectives. To analyze the possibility of using online learning as a method of preventing gout.
Materials and methods. The study was conducted in Turkmenistan with the participation of 50 patients who underwent online training on gout from October 2023 to October 2024. At the end of the training period, all patients filled out a questionnaire that

included 22 questions divided into two blocks: Block I — general questions about age, gender, bad habits and frequency of exacerbations, block II — assessment of the usefulness of information and the desire to continue training on a 5-point scale. An open-ended question was also asked about the greatest impressions of online learning.
The training took place on the Spherum platform, lasted 1 year and included 20 lectures and 3 practical classes. The results were analyzed using Statistical Analysis Software 17.0. Statistical significance was processed using Analysis of Variance analysis.
Results. Block I. In the first block, it was found that the number of patients under the age of 40 was 16% (8 people), 20% (10 people) under the age of 50, 26% (13 people) under the age of 60, and 38% (19 people) over the age of 60. 70% of the respondents are men. 54% of the patients had bad habits, while only 14% knew about gout in their relatives. More than half of the respondents noted at least one exacerbation of the disease over the past year.
Block II. In block II, 82% of the participants learned about new risk factors for gout, including the effect of medications on uric acid levels. 56% realized the need for lifestyle adjustments, including proper nutrition, weight maintenance, and physical activity. 98% of the respondents expressed a desire to continue their studies. Most of the participants noted that the interesting side of online learning is the opportunity to communicate with like-minded people, share experiences and receive psychological support.
Conclusion. Online learning can be successfully used as a method of preventing gout. Communication in a group of like-minded people helps to improve the prevention of gout and allows you to receive timely support and start treatment of exacerbations.

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HOW TO PREVENT THE DEVELOPMENT OF GOUT?

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Objectives. To evaluate the effect of physical activity and nutrition on the frequency of gout attacks.
Materials and methods. The study was conducted in Turkmenistan from December 2021 to December 2023. The participants were 90 patients with gout who had a history of the disease for more than 5 years. The average age was 52.2 ± 2.9 years (62 men and 28 women). The patients were divided into two groups: experimental and control, with 45 people each. The experimental group visited the pool twice a week for 40 minutes and did physical therapy with gym poles once a week for 30 minutes, and also followed a diet of up to 1800 kcal/day. The control group led a normal lifestyle. To evaluate the results, a questionnaire was conducted, which focused on the frequency of gout attacks. The questionnaire contained the following questions:
1. Have you had a gout attack in the last two years? (yes/no)
2. Have you had a gout attack in the last year? (yes/no)
3. Was there any deterioration during the course of the disease (seizures became more frequent)? (yes/no)
The results were processed in Statistical Analysis Software17.0. Statistical significance was processed using Analysis of Variance analysis
Results. In the experimental group, 31 patients (69%) had not experienced gout attacks in the last two years, 13 patients (29%) had not experienced attacks in the last year, and only 1 (2%) noted a worsening. In the control group, 42 patients (93%) reported an increased frequency of seizures, while only 3 patients (7%) indicated no seizures over the past year.
Conclusion. Preventing the development of gout is associated with lifestyle changes such as going to the pool, exercising, and following a diet of up to 1800 kcal/day. As a result, 69% of the patients in the experimental group had not experienced gout attacks in the last two years

P833

EFFECTION OF DIGITAL ORTHOPEDIC TECHNOLOGY ASSISTED MIPPO IN THE TREATMENT OF PROXIMAL TIBIOFIBULAR FRACTURE

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Abstract: ***Objective*** To investigate digital orthopedic technology assisted MIPPO in the treatment of proximal tibiofibular fracture. ***Methods*** 32 cases of proximal tibiofibular fractures were randomly divided into two groups: digital orthopedic technology assisted MIPPO group and MIPPO group, 16 cases in each group. Digital orthopedic technology assisted MIPPO group use Minmics software to simulate reduction and fixation before operation, and to determine the surgical protocol. MIPPO group's operation plan was determined according to the imaging data. The incision length, operation time, bleeding volume, fluoroscopy times, hospitalization time, first healing rate of the wound, good rate of functional reduction, good rate of Johner-Wruhs and the healing time of the fracture were compared between two groups. ***Results*** Compared to digital orthopedics technology assisted MIPPO group and MIPPO group, there were no significant difference in aspects of incision length (12+1.21cm *vs.* 13.1+1.41cm), wound healing rate (100% *vs.*100%), Johner-Wruhs excellent rate (98.1% *vs.* 98.2%), fracture healing time (3.1+0.2m *vs.* 3.3+ 0.7m). There were significant differences in aspects of bleeding volume (50.21±3.1mL *vs.* 78.2±2.7mL), operation time (46.2±2.1min *vs.* 67.2±2.1min), fluoroscopy times (6.2±3.41*vs.*10.2±2.1), hospitalization time (8.2±.1.9d *vs.*11.2±2.1d), excellent rate of fracture reset function (98.4% *vs.* 84.2%), P < 0.05. ***Conclusion*** According to patient's condition, digital technology assisted MIPPO could develop the best surgical plan, shorten operation time, reduce bleeding volume and fluoroscopy times, improve fracture reset function rate, it is worthy of clinical application.

P834

INCIDENCE OF OSTEOPOROSIS VERTEBRAL FRACTURES IN THE GERIATRIC PATIENTS OF EASTERN SIBERIA (RUSSIAN FEDERATION)

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Objective: Vertebral fractures are markers of osteoporosis. There is often a late diagnosis of fractures, severe pain and poor quality of life in the elderly.

Aim to study the frequency of osteoporotic vertebral fractures (VF), we formed a random sample of 420 Irkutsk residents aged 60 years and older.

Metods: In order to recruit men and women equally in six age groups, the sample was stratified by gender and age: 210 men and 210 women, 35 people in each age group (60-64 years old, 65-69 years old, 70-74 years old, 75-79 years old, 80-84 years old, 85 years old and older). 369 people participated in the study. The responsiveness of the sample was 87.9%. All the subjects (369 people: 184 women and 185 men) were examined using a «PHILIPS» device according to the standard procedure. The average age for women was 73.01±7.1 years, for men – 72.5±8.7 years. To identify the degree of correspondence between two different methods for assessing vertebral deformities (the semi-quantitative Genant method and the quantitative Felsenberg method), "kappa" statistics were used for all members of the sample.

Results: During the visual assessment of spondylograms using the H. Genant method, 4,522 vertebrae were analyzed, which accounted for 98.8% of the total number of vertebrae studied (145 vertebrae did not participate in the analysis due to pronounced projection changes). A 20% decrease in any of the vertebral body heights was detected in 94 people (40 men and 54 women), which was 25.5% (21.6% in men and 29.3% in women). Vertebral deformities were 1.4 times more common in women than in men ($p < 0.05$). The average age of individuals in the group with vertebral fractures was higher than in the group without deformities in both women (79.8±5.81 in the group with fractures and 71.4±6.9 in the group without fractures) and men (79.2±6.08 and 72.5±7.03, respectively), $p<0.05$. Osteoporotic deformities of the vertebrae were detected in 85 (23.6%) people, amounting to 18.3% in men and 28.9% in women ($p < 0.01$). The prevalence of vertebral fractures increased with age. Thus, at the age of 60-64, the incidence of osteoporotic fractures was 6.7 % fractures accounted for 6.7% in women and 3.4% in men. In the 65-69 age group: 10 and 6.7%, in the 70-74 age group 19.4 and 13.3%; in the 75-79 age group 33.3 and 19.4%, and in the 80-84 age group 46.7 and 30%, respectively. The maximum frequency of fractures was determined in people 85 years of age and older: 58.6% of women and 36.7% of men had deformities of the vertebrae. In general, the incidence of osteoporotic vertebral fractures in both sexes of the older age groups of the Irkutsk population, detected using the semi-quantitative H. Genant method, was 102.8 per 100,000 population. The lowest frequency of vertebral fractures was found at the age of 60-64 years – 15.8 per 100,000 in women and 12.8 per 100,000 in men, increasing with age, reaching maximum rates in the group of 85 years and older – 721.7 per 100,000 in women and 1469 per 100,000 in men ($p < 0.05$) At the next stage, the spondylograms of 360 people (180 women and 180 men) were examined using the quantitative morphometric method. At the next stage, the spondylograms of 360 people (180 women and 180 men) were examined using the quantitative morphometric Felsenberg method. A quantitative assessment of the shape of 4,522 vertebrae was performed. 101 (28%) patients: 61 (33.9%) women and 40 (22.2%) men had 226 deformed vertebrae (134 in women and 92 in men).

Conclusion: A study of the frequency of vertebral fractures in elderly and senile Irkutsk residents revealed high rates in both sexes, increasing with age.

P835

DENOSUMAB FOR THE TREATMENT OF OSTEOPOROSIS IN HONG KONG CHINESE WOMEN: COMPLIANCE, EFFICACY AND ADVERSE EVENTS

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Objectives

To study the followings for denosumab in treating Chinese women with osteoporosis:

- Efficacy in increasing bone mineral density
- Compliance to treatment
- Adverse events

Material and methods

Six hundred and fifty-five postmenopausal women with osteoporosis or osteopenia with major risk factors, or fracture history were recruited. Subjects were treated by Denosumab injection every 6 months. Bone mineral density (BMD) was measured by Dual X-Ray densitometry (DEXA). Subjects were followed up for 5 years.

Results

A total of 655 subjects were recruited in the whole study for compliance, and 283 subjects participated in the DEXA study. The BMD increase is shown in the table. The percentage increase was comparable to international trials e.g. The Freedom Study. The compliance dropped quite rapidly and was 49% for the fifth injection; and 15% for the 11 injections.

No osteoporosis of the jaw nor atypical femoral fracture were observed. One patient developed skin reaction which led to discontinuation of treatment.

Conclusion

Denosumab is a safe and efficacious drug for treating osteoporosis in Chinese women. Efforts should be made to increase long term compliance.

Percentage change (mean±SD) in BMD at the total hip and total spine

	1st year 6 months after 2nd injection (N=283)	3rd year 6 months after 6th injection (N=144)	5th year 6 months after 10th injection (N=63)
Total hip			
BMD (gm/cm^2)	0.730±0.094	0.738±0.098	0.736±0.096
Percentage change from baseline	2.69±2.55	4.90±3.20	6.99±3.68
Total spine			
BMD (gm/cm^2)	0.832±0.100	0.838±0.091	0.860±0.091
Percentage change from baseline	4.33±4.18	7.20±5.31	10.08±7.09

P836

SIX-MINUTE WALK TEST PERFORMANCE CORRELATES WITH TRABECULAR BONE SCORE IN A GROUP OF OLDER SARCOPENIC WOMEN

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Aim: The main aim of the current study was to explore the relationship between the performance in the Six-minute walk test (6MWT) and trabecular bone score (TBS) in a group of older sarcopenic women.
Methods: A total of 36 women whose ages range from 60 to 82 years participated in this study. The participants were recruited from multiple cities in north Lebanon. In addition, the participants underwent multiple clinical and physical tests including DXA scan, 6MWT, handgrip and vertical jump test. The participants were diagnosed as sarcopenic based on the skeletal muscle mass index results (<5.5 kg/m^2) and handgrip test (<20 kg) as determined by the requirements of EWGSOP to diagnose sarcopenia. In addition, L1-L4 TBS scores were recorded for each individual by DXA. Associations between clinical characteristics and TBS were given as Pearson correlation coefficients. Multiple linear regression analysis models were used to test the relationship of TBS with 6MWT performance/vertical jump/physical activity level and age.
Results: There was a significant correlation between the 6MWT performance and the L1-L4 TBS (r=0.42; p=0.01). In addition, a significant correlation was present between L1-L4 TBS and vertical jump height (r=0.35; p=0.03). Moreover, L1-L4 TBS presented a significant correlation with physical activity level (r=0.38; p=0.02). Age presented a significant positive correlation with 6MWT performance (r= 0.33; p= 0.04), physical activity level (r= 0.32; p= 0.05) and L1-L4 TBS (r= 0.35; p= 0.033). However, age did not present a significant correlation with vertical jump height (r= -0.11; p= 0.51). Moreover, the positive association between L1-L4 TBS and 6MWT remained significant after controlling for age. In addition, the positive association between L1-L4 TBS and vertical jump remained significant after controlling for age.
Conclusion: The present study suggests that the performance in the 6MWT and vertical jump level are significant independent predictors of L1-L4 TBS in older sarcopenic women.

P837

A RETROSPECTIVE CLAIMS DATA ANALYSIS ON HEALTHCARE RESOURCE UTILIZATION OF PATIENTS TREATED WITH ROMOSOZUMAB IN GERMANY

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Objective
This study aimed to describe patient characteristics and costs associated with romosozumab treatment in Germany.
Material and Methods
This was a retrospective analysis of German statutory sick funds data covering a population of 6.3 million insured persons. Costs (inpatient, outpatient, medication) were calculated in patients with ≥1 pharmacy dispensation of romosozumab (index = date of 1st dispensing) and who were observable 2 years prior and up to 2 years after index.
Results
138 female romosozumab patients were included in the analysis. They had suffered 310 recorded fractures in the year prior to index. In those observable for at least 1 year (n=71) after index, the mean total costs per patient were 11,109 [SD 13,314; median 8,033] EUR (inpatient: 5,834 [SD 8,343; median 2,181] EUR / outpatient: 1,801 [SD 1,732; median 1,420] EUR / medication: 3,473 [SD 9,220; median 770] EUR) within the year prior 1st romosozumab dispensation and 18,630 [SD 24,470; median 12,215] EUR (inpatient: 2,425 [SD 4,269; median 0] EUR / outpatient: 1,803 [SD 1,551; median 1,313] EUR / medication: 14,403 [SD 24,025; median 9,653] EUR) within the first year after index.
In patients with 2 years of follow-up (n=22) the mean total costs per patient decreased substantially within the second year after index compared to the pre-index mean total costs (Fig.). Inpatient costs were approx. 4.5 and 10 times lower in the second year after index compared to the year 2 years and the last year prior to index, respectively.
Within the first and second year after index 50% and 75% of patients were not admitted to hospital, respectively.
Conclusion
Total patient costs in the year before and the year after starting romosozumab were similar despite the additional cost of the medication. During the second year after 1st romosozumab administration total patient costs reduced to levels lower than those before starting romosozumab. In addition, inpatient costs were lower within the two years after index than the costs in the last and the year 2 years before index.

Acknowledgments
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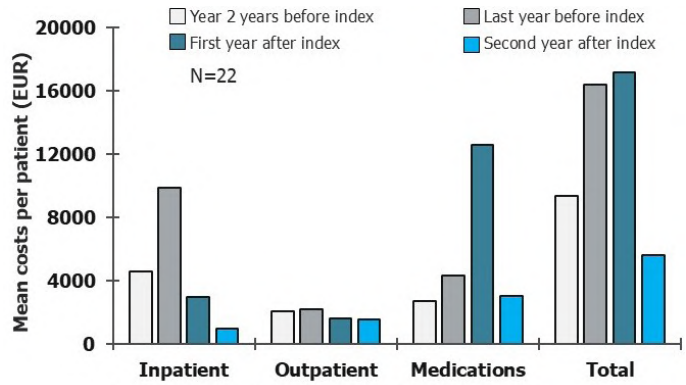
Disclosure
LG & MH were / are employees of GWQ which received funding from UCB / Amgen to conduct this study. HDP & LM are employees / LM is shareholder of UCB.



Periodes	Mean inpatient costs	Mean outpatient costs	Mean medication costs	Mean total costs
Year 2 years before index	4,584 € (SD 8,545)	2,053 € (SD 2,433)	2,712 € (SD 7,061)	9,350 € (SD 11,483)
Last year before index	9,889 € (SD 12,201)	2,181 € (SD 2,343)	4,319 € (SD 9,370)	16,390 € (SD 15,956)
First year after index	2,975 € (SD 5,680)	1,624 € (SD 905)	12,565 € (SD 7,584)	17,165 € (SD 8,606)
Second year after index	1,001 € (SD 3,272)	1,572 € (SD 1,235)	3,031 € (SD 5,854)	5,604 € (SD 7,778)

Figure: Costs in the year 2 years (730-366 days) and last year (365-0 days) prior index and first and second year (1-365 & 366-730 days) after index in patients observable for the full two years after index

P838

ASSOCIATION OF ANGIOPOIETIN-LIKE PROTEIN TYPE 6 WITH HYPERTENSION IN PSORIATIC ARTHRITIS PATIENTS

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Purpose of the study:
To determine associations between serum angiopoietin-like proteins (Angptl) of different types and arterial hypertension (AH) in psoriatic arthritis (PsA) patients.
Materials and Methods.
The content of serum Angptl types 3, 4 and 6 patients was studied in 45 PsA by enzyme immunoassay (in 60% of cases metabolic syndrome was diagnosed, in 42.2% the presence of AH was confirmed).
Results and Discussion.
An intergroup comparison of Angptl levels in patients with/without arterial hypertension was performed (Table).
Table. Content of Angptl types 3,4 and 6 in PsA patients depending on AH

Indicators	Patients with AH (n=19)	Patients without AH (n=26)
Angptl3, pg/mL	1103 ± 319	1059 ± 372
Angptl4, pg/mL	436 ± 210	349 ± 133
Angptl6, pg/mL	5,64[4,3;7,0]	4,03[3,6;6,0] #

Note: # – p<0.05.
Angptl 3 and 4 types were not significantly different in groups of PsA patients with and without arterial hypertension (p>0.05), but a significant increase of Angptl6 in PsA patients in the presence of arterial hypertension was clearly demonstrated (M-WUtest, p=0.015). The effect of arterial hypertension on the content of different types of Angptl in the presence of metabolic syndrome (MS) was also demonstrated only for Angptl6 (p=0.044).
Conclusions.
Therapeutic strategies for PsA with MS targeting Angptl6 may be beneficial for patients with hypertension and possibly reduce cardiovascular risk.

P839

EVALUATING FRAX CORRECTIONS IN PREDICTING OSTEOPOROSIS TREATMENT RECOMMENDATIONS IN TYPE 2 DIABETES MELLITUS : A PILOT STUDY IN INDIA

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Objective: The study aimed to evaluate the effectiveness of unadjusted FRAX, the 10-year age adjustment, and the rheumatoid arthritis (RA) input as proxy in predicting osteoporosis treatment recommendations for patients with type 2 diabetes mellitus (T2DM), compared to bone mineral density (BMD) based thresholds outlined in guidelines.
Materials and methods: We recruited 100 participants with T2DM from two tertiary care centers in India for a prospective pilot study. FRAX scores without BMD were calculated for all participants. Adjusted FRAX scores without BMD were derived by increasing the age by 10 years and by adding the RA input as adjustments for T2DM. The scores were mapped onto an Indian risk stratification model of low, medium and high risk based on validated FRAX thresholds.(1) All participants underwent BMD testing, and treatment recommendations were determined based on the American Diabetes Association guidelines (fragility fracture or T-score ≤ -2.0). Prediction rates of the two corrections were compared.

Results: The study cohort consisted of 61% women with a mean age of 66.53 ± 9.43 years. Key characteristics included a mean BMI of 25.67 ± 5.17 kg/m², mean HbA1c of 8.69 ± 2.75%, and mean diabetes duration of 13.15 ± 10.09 years, with 15% reporting fragility fractures. The mean T-scores were -1.27 ± 1.37 at the femoral neck, -0.96 ± 2.04 at the lumbar spine, and -1.7 ± 2.0 at the distal one-third radius. Correct treatment recommendations were identified in 86.9% of cases using unadjusted FRAX, in 90.2% with the 10-year age increase input, and in 97.8% with the RA input (Table 1).
Conclusion: In this pilot study, the inclusion of RA input to FRAX was the best correction, leading to the identification of more individuals with T2DM who met the recommended treatment thresholds for osteoporosis. The RA input FRAX correction might emerge as the most suitable tool for predicting fracture risk in T2DM in resource-constrained regions. Larger studies are warranted to validate these findings and explore clinical implications.

References
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Table 1 : Predictive ability of FRAX corrections in T2DM

	FRAX without BMD (n=100)			FRAX adjusted Age value increment 10 years (n=94)			FRAX adjusted RA input to FRAX (n=100)		
Indication for treatment (as per ADA guidelines)	*High risk*	*Medium risk*	*Low risk*	*High risk*	*Medium risk*	*Low risk*	*High risk*	*Medium risk*	*Low risk*
Yes (n = 46)	6	26	14	19	18	4	19	26	1
No (n = 54)	1	24	29	9	41	3	4	47	3

Risk stratification into high, medium, and low risk, respectively, based on validated FRAX thresholds for India
Treatment recommendations for
- High Risk : May be treated without BMD measurement
- Medium Risk : Measure BMD
- Low Risk : Measurement of BMD or treatment not required

The predictive ability was considered accurate if the treatment recommendation was "yes" and the patient was classified in the high risk or medium risk category

P840

PREVALENCE AND IMPACT OF GONARTHROSIS AND SPONDYLOARTHROSIS IN A COHORT OF PATIENTS WITH FIBROMYALGIA

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Objectives: To evaluate the prevalence of gonarthrosis and spondyloarthrosis in a cohort of patients with fibromyalgia and the impact of their presence on these patients after multidisciplinary treatment.
Methods:A retrospective study assessed the prevalence of gonarthrosis and spondyloarthrosis in fibromyalgia patients (ACR 1990 + ACR 2010) treated in our Fibromyalgia Unit who have undergone multidisciplinary treatment for 12 months. We collected data on pain (VAS), fatigue, and functionality (FIQ) before and after 12 months of multidisciplinary treatment, comparing patients with and without these comorbidities.
Results:630 fibromyalgia patients (96% women, mean age 48.4 years) were included. 156 had spondyloarthrosis, 26 had gonarthrosis, and 14 had both comorbidities. Patients with spondyloarthrosis showed a reduction in pain (VAS from 6.5 to 3.6), fatigue (VAS from 6.33 to 4.2), and FIQ scores (from 60.5 to 33.5). Those with gonarthrosis had similar improvements (pain VAS from 6.4 to 3.3, fatigue VAS from 6.2 to 4.3, FIQ from 61.2 to 32.2). Patients with both comorbidities showed pain reduction (VAS from 6.8 to 3.4), fatigue reduction (VAS from 6.8 to 4.4), and improvement in FIQ (from 61.1 to 32.6). In the 434 patients with only fibromyalgia, pain decreased from 6.5 to 3.5, fatigue from 6.6 to 4.1, and FIQ from 60.7 to 32.5.
Conclusions: The presence of gonarthrosis, spondyloarthrosis, or both does not seem to significantly affect the EVA scales for pain and fatigue or functional capacity in patients diagnosed with fibromyalgia according to both ACR 1990 and 2010 classification criteria, and who are undergoing specialized multidisciplinary treatment. The presence of gonarthrosis and spondyloarthrosis does not appear to influence the intensity and extent of generalized hyperalgesia in patients with fibromyalgia. Multidisciplinary treatment for fibromyalgia, even when the patient has gonarthrosis and spondyloarthrosis, remains crucial for the overall clinical improvement of the disease.

P841

INTEGRATED MULTI-OMICS AND MACHINE LEARNING APPROACHES REVEAL THE CHARACTERISTICS OF MACROPHAGES IN POSTMENOPAUSAL OSTEOPOROSIS AND IDENTIFY SMAD7 AS A KEY REGULATOR

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INTRODUCTION: Postmenopausal osteoporosis (OP) is a chronic bone disease characterized by low bone mineral density and microstructural deterioration. While early research focused on inhibiting osteoclast activity, recent perspectives highlight the interaction of bone resorption and formation. Given that macrophages serve as precursors to osteoclasts and secret cytokines that stimulate osteoblasts, they may be promising for identifying new dual-effect drug targets. In this study, we employed multi-omics and machine learning methods to investigate the molecular characteristics of macrophages in OP and identify some novel drug targets. We suggest that this research will help understand the OP's molecular mechanisms and assist the development of new

therapies.

METHODS: We integrated 6 scRNA-seq samples and 12 bulk RNA-seq samples as a discovery cohort to identify potential drug targets. Additionally, we utilized 20 paraffin tissue samples and 20 bulk RNA-seq samples for validation. Differential gene expression analysis was performed on the scRNA-seq data, while Weighted Gene Co-expression Network Analysis (WGCNA) was utilized to analyze the bulk RNA-seq data. Furthermore, we employed Lasso regression and Support Vector Machine (SVM) models to identify core genes. Subsequently, we performed Protein-Protein Interaction (PPI) analysis, cellular communication inference, differentiation trajectory analysis, and network pharmacology analysis based on the identified genes.

RESULTS: In the discovery cohort, we observed a significant difference in the proportion of macrophages **(Fig.1A)**. We identified a module correlated with macrophages and detected the differentially expressed genes **(Fig.1B-C).** The KEGG enrichment analysis revealed that these differential genes were significantly enriched in ferroptosis-related pathways **(Fig.1D)**. Additionally, the core genes identified in the PPI network showed a significant correlation with ferroptosis (**Figure 2A-B**). Moreover, machine learning techniques identified four core genes, with Smad7 emerging as the most critical, demonstrating a strong connection in the validation cohort (**Figure 2C-D**). Finally, we validated the expression of Smad7 and the differential proportions of macrophages in paraffin-embedded tissues using immunohistochemical staining.

DISCUSSION: In conclusion, we first detected a significant difference in the proportion of macrophages in osteoporosis, along with identifying differentially expressed genes. Enrichment analysis and the PPI network indicated that these genes were highly correlated with ferroptosis mechanism, which may help explain the varying distribution of macrophages. Machine learning approaches further identified several novel targets, with Smad7 emerging as the most significant and promising regulator in the validation cohort. Our findings provide novel insights for targeted treatments for OP, while also contributing to the understanding of the underlying molecular mechanisms.

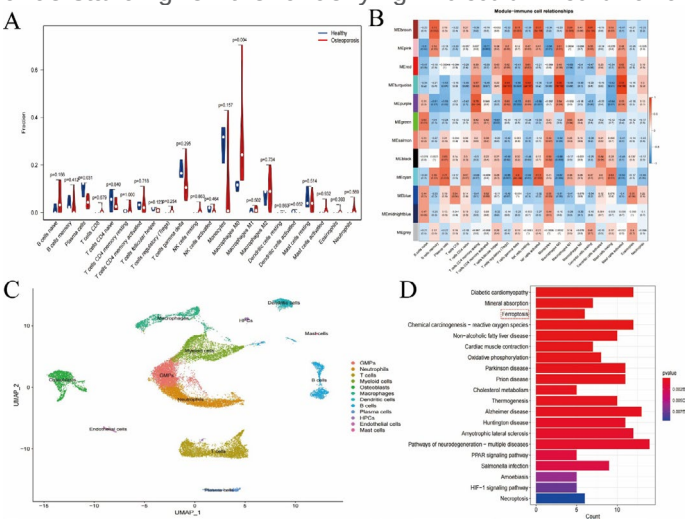

Figure 1 The differential and enrichment analysis of scRNA-seq and bulk RNA-seq

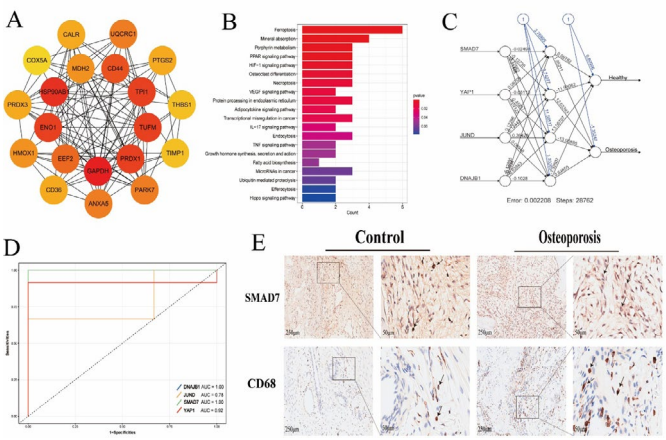

Figure 2 The PPI network, machine learning results and validation

P842

THE DUAL IMPACT OF CHRONIC LOW BACK PAIN ON PHYSICAL AND MENTAL HEALTH: INSIGHTS FROM A QUALITY OF LIFE ASSESSMENT

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Objective: To assess the impact of chronic low back pain on patients' quality of life.

Methods: A cross-sectional study was conducted on 124 patients consulting for chronic low back pain. Quality of life was assessed using the SF-36 score, which evaluates both the physical component summary (PCS) and the mental component summary (MCS).

Results: The study included 124 patients, predominantly male (sex ratio: 4.4), with a mean age of 53.3 ± 13 years (range: 15–80 years) and an average duration of low back pain of 6.69 ± 4.67 years (range: 1–20 years).

The **PCS** had a mean score of 41.41 ± 17.94 (range: 11.5–87.5), with impairments observed in 46.8% of patients. Among the physical domains, *physical functioning* (D1) was moderately affected (58.08 ± 26.52), while *role limitations due to physical health* (D2) and *bodily pain* (D3) showed severe impairments with mean scores of 20.95 ± 35.71 and 20.94 ± 37.66, respectively. *General health perception* (D4) scored 41.12 ± 19.55.

The **MCS** had a mean score of 41.92 ± 20.74 (range: 10.75–94), with impairments in 46% of patients. E*nergy levels* (D5) were relatively preserved (53.03 ± 24.28), also *social functioning* (D6) scored 59.09 ± 33.03. In contrast, *emotional role limitations* (D7) and *mental health* (D8) were moderately affected, with scores of 43.56 ± 24.65 and 49.14 ± 8.89, respectively.

Conclusion: Chronic low back pain significantly affects patients' quality of life, with notable impairments in both physical and mental domains. These findings emphasize the need for comprehensive management strategies targeting both aspects to improve patient outcomes.

P843

THE ROLE OF PAIN INTENSITY AND CLINICAL FEATURES IN THE QUALITY OF LIFE OF CHRONIC LOW BACK PAIN PATIENTS

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Objective: To analyze the impact of low back pain characteristics on the quality of life in patients with chronic low back pain.
Methods: A cross-sectional study was conducted including patients consulting for chronic low back pain. The studied parameters included disease duration, pain type (nociceptive, neuropathic assessed by the DN4 scale), radicular pain (sciatica, cruralgia), clinical characteristics (spinal syndrome, stiffness, antalgic posture), and neurological signs. Quality of life was assessed using the SF-36 score, covering both physical and mental components.
Results: The study included 124 patients, predominantly male (sex ratio: 4.4), with a mean age of 53.3 ± 13 years and a mean disease duration of 6.69 ± 4.67 years. The mean pain intensity, assessed by the Visual Analog Scale (VAS), was 6.3 ± 1.87. Neuropathic pain (median DN4 score: 2 [0-5]) was identified in 57 patients (46%). Of these, 84 patients (68%) reported radicular pain: 7% had L3 cruralgia, 45% had L5 sciatica, and 48% had S1 sciatica. Impulsive pain was reported by 35%. Spinal syndrome was present in 91.9%, spinal stiffness in 75% and 70.2% had radicular syndrome. Neurological disorders were found in 8.9% of patients, including 8.1% with sensorimotor deficits and 6.5% with vesicourethral dysfunction.
Physical component (PCS) impairment was associated with higher VAS scores (6.8 vs. 5.9; p=0.018) and more frequent spinal syndrome (98% vs. 80%; p=0.004). Cruralgia was more frequent in the non-impaired PCS group (29% vs. 9%; p=0.034). No significant difference was found for disease duration, neuropathic pain, or sciatica.
Impaired mental component summary (MCS) scores were associated with higher VAS scores (7 ± 1.5 vs. 5.5 ± 1.9; p=0.002), more frequent impulsive pain (44% vs. 19%; p=0.045), and increased spinal stiffness (81% vs. 57%; p=0.035)
Conclusion: Pain intensity and clinical characteristics, such as spinal syndrome and stiffness, have a significant impact on the quality of life of patients with chronic low back pain. These findings underscore the need for a targeted management approach that addresses both the physical and mental aspects of the condition to improve patients' well-being.

P844

FUNCTIONAL DISABILITY AND QUALITY OF LIFE IN CHRONIC LOW BACK PAIN

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Objective: To explore the correlation between the functional impact of chronic low back pain (CLBP) and quality of life.
Methods: A cross-sectional study was conducted on 124 patients consulting for chronic low back pain. The functional impact of CLBP was assessed using the Oswestry Disability Index (ODI), a validated tool for measuring functional disability. Quality of life was evaluated using the SF-36 questionnaire, which assesses both the physical component score (PCS) and mental component score (MCS)
Results: A total of 124 patients were included, predominantly male (sex ratio: 4.4), with a mean age of 53.3 ± 13 years (range: 15–80 years) and a mean duration of CLBP of 6.69 ± 4.67 years (range: 1–20 years). The mean ODI score was 42.7 ± 19.6 (range: 0–92%). Regarding disability levels, 15.3% of patients had minimal disability, 21% had moderate disability, 44.4% had severe disability, 17.7% had very severe disability, and 1.6% had total disability. A significant association was found between the degree of functional disability and the physical component score (PCS).
None of the patients in the group with an impaired SF-36 physical component score (PCS) were free of disability, compared to 30% in the non-impaired PCS group (p<0.001). Moderate disability was significantly more frequent in the impaired PCS group (67% vs. 30%, p<0.001), while severe and very severe forms were exclusively observed in this group (10% and 2%, p<0.001). Moreover, patients with an impaired SF-36 mental component score (MCS) exhibited significantly greater functional disability (p<0.001). Similarly, the degree of functional disability was significantly associated with the mental component score (MCS) (p<0.001) (table1)

OSDI	PCS impaired	PCS not impaired	P	MCS impaired	MCS not impaired	p
No disability	0%	30%	<0.001	2%	24%	**<0,001**
Mild disability	21%	40%		16%	52%	
Moderate disability	67%	30%		75%	10%	
Severe disabilit	10%	0%		5%	14%	
Very severe disability	2%	0%		2%	0%	

Conclusion: The functional impact of chronic low back pain is significantly associated with reduced quality of life, affecting both physical and mental health. These findings emphasize the need for a comprehensive management approach that addresses both the physical and psychological aspects of the condition.

P845

THERIPARATIDE AND VERTEBRAL PAIN

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Theriparatide is a drug used in the treatment of osteoporosis that has been shown to have positive effects in reducing vertebral pain and improving the quality of life in osteoporotic patients. A prospective longitudinal observational study carried out in the rehabilitation service of the Insular Hospital of Gran Canaria evaluated 30 patients with osteoporosis and vertebral pain treated with teriparatide. The results indicated a significant decrease in pain and an improvement in the quality of life of these patients

P846

ANTI-RESORPTIVE THERAPY FOR PREGNANCY- AND LACTATION-ASSOCIATED OSTEOPOROSIS

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Objective: To evaluate the outcomes of treatment for pregnancy- and lactation-associated osteoporosis.
Materials and Methods: The study included 27 women aged 18-40 years diagnosed with pregnancy- and lactation-associated osteoporosis.
Results: All women were advised to stop breastfeeding immediately after the diagnosis of PLO and received individualized osteoporosis treatment, including bone-anabolic and anti-resorptive medications. All patients were administered 1000 mg of calcium and 800 IU of vitamin D3 daily. The 12-month treatment outcomes included the following indicators: blood markers of bone metabolism and bone mineral density (BMD).
After one year of therapy, the patients reported significant reductions in back pain and no new clinical vertebral fractures. Blood calcium and phosphorus levels remained relatively unchanged. There was a significant increase in average vitamin D levels (pre-treatment: 18.4±7.93 ng/ml; post-treatment: 29.1±17.1 ng/ml, p=0.002).
Parathyroid hormone (PTH) levels decreased but were not statistically significant (pre-treatment: 56.7±40.9 pg/ml; post-treatment: 38.4±19.9 pg/ml; p=0.05).
The β-CrossLaps levels, elevated before treatment (0.91±0.99 ng/ml), significantly decreased after treatment (0.40±0.41 ng/ml, p=0.02).
Alkaline phosphatase levels significantly declined during therapy (pre-treatment: 114.6±27.4 U/L; post-treatment: 38.99±31.7 U/L; p=0.01).
Osteocalcin levels also decreased significantly (pre-treatment: 132.9±66.1 ng/ml; post-treatment: 49.7±37.4 ng/ml; p=0.0001).
BMD increased by 10.9% in the lumbar spine, by 5.1% and 4.1% in the left and right femoral bones, and by 6.3% and 5.9% in the neck of the left and right femur, respectively.
Conclusion: Anti-resorptive therapy, combined with cessation of breastfeeding and supplementation with calcium and vitamin D, appears to reduce severe back pain, significantly increase BMD, and help prevent further vertebral fractures.

P847

TBS AND BSI DO NOT DIFFER BETWEEN PRIMARY HYPERPARATHYROIDISM AND PRIMARY OSTEOPOROSIS PATIENTS WITH SIMILAR FRACTURE RISK

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Premise: Primary hyperparathyroidism (PHPT) is characterized by chronic excessive PTH secretion, leading to hypercalcemia. Key features include osteopenia and increased fracture risk. DXA remains the gold standard for evaluating bone mineral density (BMD) and quality using Trabecular Bone Score (TBS) and Bone Strain Index (BSI).
Objective: To evaluate BMD, TBS, and BSI in PHPT and identify differences from primary osteoporosis (PO) based on disease severity and fragility fracture predictors.
Methods: This cross-sectional case-control study compared 87 consecutive hypercalcemic PHPT patients, including symptomatic (hypercalcemic crises, clinical fractures, renal colic) and asymptomatic cases, with 173 PO patients. Vertebral fracture assessment and DXA were performed in PHPT (lumbar spine, femur, and radius) and PO (lumbar spine and femur) to detect asymptomatic fractures and calculate BMD, T-score, TBS, and BSI.
Results: In this study, 70% of PHPT patients were asymptomatic, though 54% had complications (osteoporosis, morphometric fractures, or kidney disease). PHPT patients, including asymptomatic cases, had a higher prevalence of osteoporosis (68%, 95% CI 58–78) and lower total femoral BMD (0.7±0.13) compared to PO patients (47%, 40–55; 0.8±0.14). Fragility fracture prevalence was similar between PHPT and PO (26%, 17–36 vs. 29%, 22–36). No differences in TBS or BSI were observed between PHPT and PO, but both were significantly worse in fractured versus non-fractured PHPT patients (TBS: 1.13±0.1 vs. 1.23±0.1; BSI: 2.93±0.98 vs. 2.42±0.59, p<0.05). Multivariate analysis showed that PTH and age were independent predictors of bone loss (especially femoral and radial T-scores) in PHPT, while BMI and age negatively impacted TBS (p<0.01).
Conclusions: PHPT, even in its asymptomatic form, is linked to a higher prevalence of osteoporosis and predominant cortical bone damage. While TBS and BSI do not distinguish PHPT from PO, they are valuable for predicting fracture risk in PHPT. Combining traditional DXA with TBS and BSI is essential for more accurate

fracture risk assessment and therapy selection in PHPT.

P848

AIR POLLUTION EXPOSURE AND BONE HEALTH: IDENTIFYING CRITICAL WINDOWS OF SUSCEPTIBILITY IN THE DANISH COPSAC2010 BIRTH COHORT

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Objective: We aimed to identify periods of susceptibility to air pollution in early life in relation to bone health outcomes at age six years.

Material and Methods: We used data from the $COPSAC_{2010}$ study, an ongoing population-based mother-child cohort in Denmark (n=700). We modelled daily ambient air pollution concentrations of nitrogen dioxide (NO_2) and particulate matter with a diameter of ≤2.5 and ≤10 µm ($PM_{2.5}$ and PM_{10}) at the home addresses during pregnancy and childhood, using the Danish Eulerian Hemispheric Model (DEHM)–urban background model (UBM)–Danish Air Pollution and Human Exposure Modelling System (AirGIS) model system. Bone mineral density (BMD) and area-adjusted bone mineral content (aBMC) were measured by dual-energy x-ray absorptiometry (DXA) at age six. We performed distributed lag non-linear modelling (DNLM) adjusted for several socioeconomic characteristics to assess the associations between air pollution and bone health and identify windows of susceptibility.

Results: In total, 518 children were included. We identified a window of susceptibility for PM_{10} exposure between 2.8 to 3.2 years of age with aBMC (-9.0; CI -17.9 to -0.1 per 10 µg/m3 increase in PM_{10}). In sex-stratified analyses, associations for both $PM_{2.5}$ and PM_{10} with aBMC followed similar trends, but were only statistically significant in boys, and not in girls. Also, we identified a positive association between PM_{10} and $PM_{2.5}$ from conception to ~ 7 months of gestation with aBMC (e.g., 14.4; CI 0.7 to 28.2 per 5 µg/m3 increase in $PM_{2.5}$) (**Figure**). Nevertheless, all associations dissapeared after correction for multiple testing.

Conclusion: We observed conflicting evidence regarding the impact of air pollution during pregnancy and early childhood on bone health outcomes at age six. We showed a protective effect during pregnancy, while, around 3 years of age may represent a critical period for negative effects on bone health, particular in boys.

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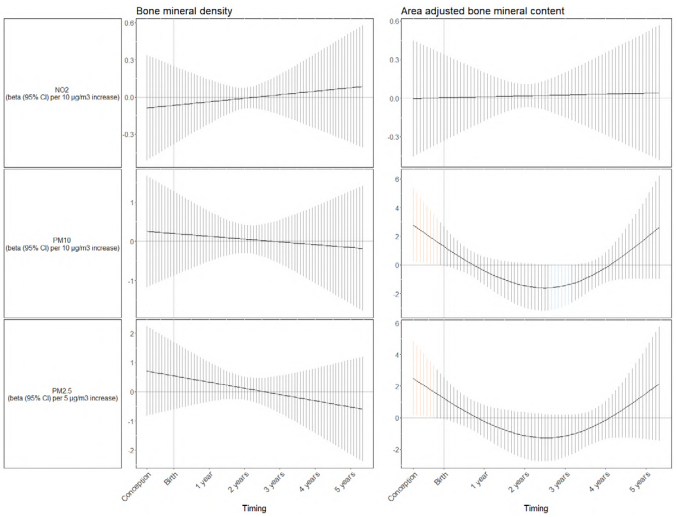

Blackline represents the beta estimate of the association between the exposure at each specific lag (1 month) and the outcome. Vertical grey, blue, and orange lines represent 95% confidence interval (CI) and indicate no divergence from the null, significant divergence from negative association, and significant divergence from positive association, respectively. Darker blue and orange colors indicate associations after correction for multiple testing (p-value < 0.025).

P849

A PHASE 3 STUDY COMPARING THE EFFICACY AND SAFETY OF PROPOSED DENOSUMAB BIOSIMILAR RGB-14-P AND REFERENCE DENOSUMAB IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS

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Objectives

To demonstrate the clinical equivalence in efficacy and compare the pharmacodynamics (PD), safety, and immunogenicity of proposed denosumab biosimilar RGB-14-P and reference denosumab (RD) in postmenopausal women with osteoporosis.

Materials and Methods

Participants were randomised 1:1 to subcutaneous RGB-14-P or RD 60 mg every 6 months, on Day 1 and Week (W) 26. At W52, a subset of participants on RD were re-randomised 1:1 to RGB-14-P or RD. Primary endpoints: Percentage change from baseline (%CfB) in lumbar spine (LS) bone mineral density (BMD) at W52 and area under the curve (AUC) of %CfB serum C-terminal telopeptide of type 1 collagen (sCTX) to W26. Secondary endpoints: %CfB in total hip (TH), LS and femoral neck (FN) BMD at W26 and W52, and vertebral and non-vertebral fragility fractures at W52. Results reported to W52 (EudraCT 2020-006017-38).

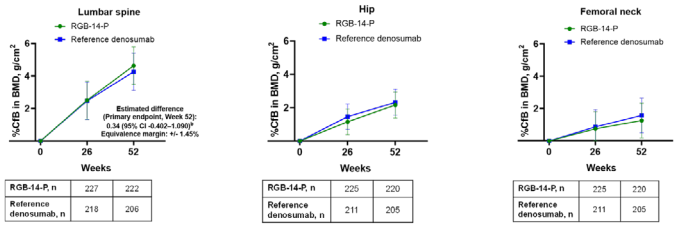
Results

Of 1210 screened participants, 473 were randomised (RGB-14-P n=242; RD n=231). Both primary endpoints were met: %CfB in LS BMD at W52 was equivalent between arms (**Figure**), and the geometric mean ratio in the AUC of %CfB in sCTX concentration was 1.01 (95% CI 0.98–1.05; p=0.494). Secondary endpoints were also met, with no statistical differences in %CfB in LS at W26, or TH and FN BMD at W26 and W52 (**Figure**). There was no meaningful difference in the incidence of vertebral (RGB-14-P, 1.7%; RD, 3.5%) or non-vertebral (RGB-14-P, 1.7%; RD, 4.3%) fragility fractures at W52. Anti-drug antibody incidence was <1% in both arms. Percentage of participants with ≥1 treatment-related treatment-emergent adverse event (TEAE) was similar between arms (RGB-14-P, 14.9%; RD, 13.9%); the most frequent TEAE was hypocalcaemia (RGB-14-P, 6.6%; RD, 6.9%). Percentage of participants with severe TEAEs was low (RGB-14-P, 3.3%; RD, 3.5%).

Conclusion

RGB-14-P demonstrated equivalent efficacy, pharmacodynamics, immunogenicity and safety with RD in postmenopausal women with osteoporosis.

Figure. Adjusted mean %CfB (95% CI) in BMD at W26 and W52, full analysis set[a]



RGB-14-P, n	227	222
Reference denosumab, n	218	206

RGB-14-P, n	225	220
Reference denosumab, n	211	205

RGB-14-P, n	225	220
Reference denosumab, n	211	205

BMD, bone mineral density; CfB, change from baseline; CI, confidence interval; W, week.
[a]Mixed model for repeated measures. [b]Equivalence met (lower/upper CI > −1.45/<1.45).
Equivalence supported by sensitivity and secondary estimand analyses.

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P850

METHODS OF EARLY DIAGNOSIS OF BONE REMODELING DISORDERS AND PREDICTION OF OSTEOPOROSIS DEVELOPMENT IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Bone tissue is metabolically active and remodeling processes are constantly taking place in it. Under normal conditions, resorption and synthesis processes are balanced in healthy bone. In patients with rheumatoid arthritis (RA), this balance is disturbed, the activity of resorptive processes begins to prevail over the construction of new bone, which can lead to the development of secondary osteoporosis (OP). It is known from clinical practice that the most effective way to preserve bone quality is early and even preventive therapeutic intervention, which allows timely prevention of bone tissue destruction. In this regard, the search for markers for early prediction of bone metabolism disorders in RA is an urgent scientific task. Objective: to assess the diagnostic significance of indicators affecting bone metabolism, for the purpose of early prediction of osteoporosis (OP) development in patients with RA. Materials and methods. The study included 88 women suffering from RA, aged 21 to 81 years. RA was diagnosed according to the ACR/EULAR criteria, 2010. The average age of patients was 47.51±9.63 years. The average duration of the disease was 7.92±5.21 years. Within the framework of the study, the ELISA test was used to determine the level of 25-OH vitamin D, the specific sequence of type I collagen and its degradation products using commercial kits. The diagnostic value of the studied parameters was determined by constructing ROC curves. Study results. When studying the diagnostic value of the level of 25-OH vitamin D, it was shown that the study of this marker in patients with RA has high prognostic significance in predicting the development of OP. The area under the ROC curve was 0.696. The diagnostic decision point was the level of 25-OH vitamin D 58.741 ng/ml. When using this cutoff point, the specificity of the method was 95.45%, the specificity was 37.88%. Evaluation of the role of the N-terminal propeptide of type 1 procollagen (P1NP) level showed that it is also a valuable diagnostic marker of AP in RA. The area under the ROC curve is 0.785. The diagnostic decision point is 50.225 ng/ml (the specificity of the method was 71.21%, the sensitivity was 81.82%). Determination of the C-telopeptide of type I collagen by constructing ROC curves showed that in the diagnosis of AP in RA, the indicator has good quality (the area under the curve is 0.595), the diagnostic decision point is 0.988 ng/ml. The sensitivity of the method was 36.36%, the specificity was 90.91%. Conclusions. Thus, the level of P1NP, C-telopeptide of type I collagen and 25-OH vitamin D have high diagnostic value and can be used for early diagnosis of bone metabolism disorders in RA and

for predicting the development of osteoporosis in patients with RA.
Keywords: rheumatoid arthritis, osteoporosis, bone remodeling markers.

P851

COMPARISON OF VITAMIN D LEVELS BETWEEN OSTEOPOROTIC PATIENTS LIVING IN NURSING HOMES AND THOSE LIVING AT HOME: BONECARE STUDY

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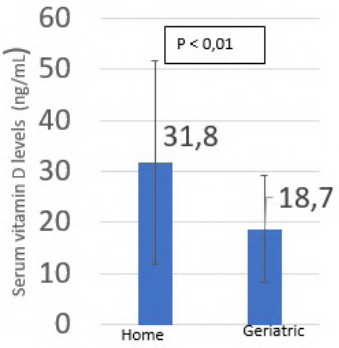
Objective To compare vitamin D levels in the osteoporotic population living in nursing homes versus those living at home, with similar functional capacity.
Material and methods Observational, cross-sectional, and descriptive study over a period of 12 months, between December 2022 and November 2023. The study was carried out in primary care health centers in Spain. Patients were selected from their electronic medical records, and the following inclusion criteria were met: > 49 years of age with a diagnosis of osteoporosis confirmed by bone densitometry (T-score ≤ -2.5 SD in femoral neck) and/or fragility fracture. Patients with other pathologies that alter bone mass were excluded.
To evaluate predictive factors, clinical and lifestyle variables are analyzed by applying multiple regression analysis. Based on the data obtained, a comparative sub-analysis was carried out between patients who lived in nursing homes versus those who live at home with similar functional capacity (Barthel index > 60 points). A total of 185 patients from nursing homes throughout Spain were included and compared with a group similar in age, sex and place of residence.
Results
The mean age of the patients was about 71.7 (±9.9) years and 91.5% of them were women. Mean serum vitamin D level (31.8 ng/mL) in outpatients compared to 18. 7 ng/mL of institutionalized patients.



There is a difference between the two of -41.2%. Of the institutionalized patients, there was a 23% lower exposure to sunlight. And 37% of them had greater skin pathology that interacted with the absorption of vitamin D.
Conclusions.
Those patients living in nursing homes had lower levels of vitamin D.

P852

DISCONTINUATION AND NON-PUBLICATION OF OSTEOARTHRITIS CLINICAL STUDIES: A CROSS-SECTIONAL ANALYSIS OF 10,686,401 PATIENTS

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Objective:
Osteoarthritis (OA) is rising at an alarming rate, affecting millions worldwide and threatening mobility, independence, and quality of life. High-quality evidence is essential to guide clinical decision-making and ensure the best patient outcomes. The discontinuation and non-publication of clinical studies are major contributors to research waste and incomplete data synthesis in evidence-based medicine.This study aims to assess the prevalence, characteristics, and publication history of OA clinical studies and investigate the causes for their non-publication or discontinuation.
Methods:
We searched OA-related clinical trials registered in ClinicalTrials.gov using NCT identifiers up to January 2, 2025. We excluded the last 24 months to account for ongoing peer reviews. Studies were considered discontinued if terminated, withdrawn, or sus-

pended and unpublished if their results were not available in a peer-reviewed journal. Data on gender, age, study type, funding, intervention, enrollment, and location were extracted. Multiple logistic regression analyzed characteristics linked to unpublished or discontinued trials.

Results:

A total of 3828 study were included, devided into 2715 (70.92%) completed, 425 (11.1%) discontinued, and 687 (17.9%) classified as of unknown status. Completed and discontinued studies were analysed, comprising 2588 interventional studies 538 observational studies. Among these, 425 were discontinued, with 9.4% of them being published despite being discontinued, and 34.8% of unknown studies were also found published. Also, almost half (47.8%) of completed studies remained unpublished. Logistic regression analysis revealed that studies funded by non-industry sources had significantly lower odds for completion compared to those funded by industry (Odds Ratio (OR) = 0.4, 95% CI [0.326, 0.513], p < 0.001). as for publication, behavioral intervention were significantly more likely to be published compared to device intervention (OR = 2.346, 95% CI: 1.594 to 3.451, p < 0.001), enrollment sizes >100 were more likely to be published than those <100 (OR = 0.575, 95% CI: 0.479 to 0.690), and non-indusrty studies were more likely to be published than industry (OR = 0.409, 95% CI: 0.326 to 0.513).

Conclusion: OA clinical studies are frequently discontinued or left unpublished, exposing participants to potential harm without benefit. This not only poses challenges in recruiting for future trials but also leads to the inefficient utilization of limited time and financial resources in medical research. Enrollment size and Funding type are the main predictors of unpublished studies.

P853

DISCONTINUATION AND NON-PUBLICATION OF KNEE OSTEOARTHRITIS CLINICAL STUDIES: A CROSS-SECTIONAL ANALYSIS OF 1,560,030 PATIENTS

M. A. Abdelsalam[1], H. M. Hafez[2], O. El-Sedafy[3], M. T. Lasheen[3], B. E. Badwy[3], R. J. Barakat[3], A. A. Mohamed[3], A. M. Hafez[4], O. S. El-Sayed[5], M. A. Mannaa[2], M. A. Ali[3], M. R. Awad[1], A. N. Bayoumy[6]

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Objective: Knee Osteoarthritis (KOA) affects millions worldwide, with prevalence rates escalating from 19.2% in individuals under 50 to 54.1% in those over 70, emphasizing the need for effective treatments and prevention. Despite the numerous clinical studies targeting KOA, many remain unpublished or discontinued, Limiting the advancement of medical knowledge and patient care. This study aims to assess the prevalence, characteristics, and publication history of KOA clinical studies and investigate the reasons for their non-publication or discontinuation.

Methods: We conducted a comprehensive search of ClinicalTrials.gov for KOA studies up to December 12, 2024. Studies completed within the last two years were excluded to account for ongoing peer review processes. Published trials were determined through their NCT identifiers. We collected and analyzed data on gender, age, study type, funding, intervention, enrollment, and location were extracted. Multiple logistic regression analyzed characteristics linked to unpublished or discontinued trials.

Results: A total of 2,614 registered studies on knee osteoarthritis were reviewed, divided into 1,871 (71.58%) completed, 258 (9.87%) discontinued, and 485 (18.55%) classified as unknown. Completed and discontinued studies were analysed, encompassing 1,821 (85.7%) interventional studies and 303 (14.3%) observational studies. Among these, 258 were discontinued, with 10.4% of them being published despite being discontinued, and 35.4% of unknown studies were also found published. Logistic regression analysis indicates that studies funded by industry were twice as likely to be completed compared to studies funded by non-industry sources (Odds Ratio (OR) = 2.018 (95% Confidence interval (CI): 1.476 to 2.759, p < .001). Regarding publication, Studies with a procedure intervention were significantly less likely to be published compared to studies with behavioral interventions (OR = 0.424, 95% CI: 0.2532 to 0.711, p = 0.001), Studies with > 100 participants were significantly more likely to be published than those with < 100 participants (OR = 2.314, 95% CI: 1.7470 to 3.066, p < .001), and Observational studies were significantly less likely to be published than interventional studies (OR = 0.531, 95% CI: 0.3520 to 0.800, p= 0.002).

Conclusion: KOA clinical studies are frequently discontinued or left unpublished, exposing participants to potential harm without benefit. Enrollment size and study designs are the main predictors of unpublished studies. Regulatory bodies and journals should enforce stricter policies to ensure timely publication of results and minimize research waste.

P854

EFFICACY OF INTRA-ARTICULAR HYALURONIC ACID INJECTION FOR NONSURGICAL MANAGEMENT OF CARPOMETACARPAL OSTEOARTHRITIS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CLINICAL TRIALS

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Objective: Carpometacarpal osteoarthritis (CMC OA) is a painful

condition affecting 21% of hand OA patients. Various treatment modalities have been explored to reduce pain and improve function, including intra-articular injections of hyaluronic acid (HA). However, the effectiveness of HA in managing CMC OA remains a topic of debate.

Methods: We conducted a systematic search across multiple databases, including PubMed, Cochrane Library, Web of Science, and Scopus from inception till February 1, 2024. We included randomized clinical trials evaluating the efficacy of HA in CMC OA. The main outcome was pain at rest measured by visual analogue scale (VAS). We stratified the outcome into short-term (after 1 month) and medium-term (after 3 months) follow-up and long-term (after 6 months) follow-up. We used Rayyan for identifying duplicates, title, abstract and full-text screening and Review Manager (RevMan) software V.5.3.5 for data analysis.

Results: This systematic review and meta-analysis incorporates data from nine studies, of which seven were included in the main outcome analysis, encompassing a total of 1,070 patients diagnosed with CMC osteoarthritis. The primary objective was to evaluate the efficacy of HA treatment across multiple outcome measures. The VAS for pain relief served as the primary endpoint, demonstrating a significant improvement with HA treatment in short-term (standardized mean difference [SMD] = -0.32, 95% confidence interval [CI]: [-0.52 to -0.12]) and medium-term (SMD = -0.56, 95% CI: [-0.81 to -0.31]) follow-up and long-term (SMD = -0.29, 95% CI: [-0.54 to -0.04]) follow-up than the control groups. However, for grip strength, the analysis did not reveal a statistically significant difference (SMD = 0.18, 95% CI: [-0.17 to 0.52]). Similarly, HA treatment had no significant impact on tip pinch strength (SMD = -0.23, 95% CI: [-0.58 to 0.11]).

Conclusion: Intra-articular HA injections provide pain relief in CMC OA, as evidenced by improvements in VAS scores. However, grip strength and tip pinch strength did not show significant differences. Further research and larger randomized controlled trials are warranted to validate these findings.

P855

MY SHOULDER HURTS, WHAT SHOULD I DO? A SYSTEMATIC REVIEW AND BAYESIAN NETWORK META-ANALYSIS OF DIFFERENT INJECTABLES IN GLENOHUMERAL OSTEOARTHRITIS

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Objective: Glenohumeral Osteoarthritis (GH OA) significantly impacts joint function and quality of life. Various intra-articular injectable treatments, including hyaluronic acid (HA), corticosteroids (GCs), platelet-rich plasma (PRP), and bone marrow aspirate (BMA), aim to alleviate these symptoms. This systematic review and Bayesian network meta-analysis aims to compare their efficacy in alleviating pain, reducing disability, improving range of motion (ROM) and enhancing patient reported outcomes.

Methods: We conducted a systematic search across multiple databases, including PubMed, Cochrane Library, Web of Science, and Scopus from inception till April 1st, 2024. We included clinical studies evaluating the efficacy of HA, GCs, PRP, and BMA in GH OA. The outcomes included pain measured by the visual analogue scale (VAS), range of motion (ROM), disability measured by the Shoulder Pain and Disability Index (SPADI), and patient-reported outcomes assessed by the Western Ontario Osteoarthritis of the Shoulder (WOOS). We used Bayesian network meta-analysis (NMA) model to compare among the included interventions. We calculated the mean difference (MD), 95% credibility interval. The P score was used to rank the efficacy of the interventions. Forest and network plots for each outcome were generated using R version 4.4.0, Build 748 (RStudio, Inc.).

Results: This systematic review and Bayesian network meta-analysis incorporates data from 15 studies, encompassing a total of 1,968 patients diagnosed with GH OA. Pain relief measured by VAS served as the primary endpoint. Among the comparisons of HA, GCs, BMA, PRP, and placebo, GCs injections had the highest mean difference compared to placebo, although the difference was not statistically significant. GCs injections: Mean Difference (MD) = 12, 95% Credible Interval (CrI) = -15 to 40. As for ROM, HA is the highest (HA: MD = 8.4, 95% CrI = -11 to 28) but similar to the VAS results, neither HA nor GCs intraarticular injections show a statistically significant improvement in ROM compared to placebo. In SPADI, HA (HA: MD = -0.46, 95% CrI = -0.47 to -0.45.) shows a statistically significant improvement over GCs and PRP. Regarding WOOS, no treatment showed significant improvement. However, PRP (MD = 2.3, 95% CrI: [-3.9 to 4.0]) demonstrated a numerically higher mean difference compared to GCs and BMA.

Conclusion: Intra-articular HA injections significantly improve pain and reduce disability in GH OA. However, none of the treatments demonstrated significant improvements in ROM or patient-reported outcomes. High-quality randomized controlled trials are needed to confirm these findings and inform clinical practice.

P856

CAN'T SLEEP, WON'T SLEEP: A SYSTEMATIC REVIEW AND META-ANALYSIS OF INSOMNIA PREVALENCE IN 70,105 RHEUMATOID ARTHRITIS PATIENTS

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Objective: Insomnia is a significant challenge for rheumatoid arthritis (RA) patients. Chronic pain conditions often exacerbate sleep disturbances, creating a vicious cycle where pain and sleep deprivation perpetuate each other with pain not only interrupting sleep but also causing poor sleep quality contributing to increased pain sensitivity. Insomnia exacerbates the pain and fatigue associated with RA, further diminishing physical function and psychological well-being. Despite this, the prevalence and impact of insomnia in RA patients remain under-recognized and under-treated. The aim of this work is to identify the frequency of insomnia in RA patients, highlighting the necessity for more research, increased awareness, and targeted therapeutic interventions.

Methods: We systematically searched PubMed, Web of Science, and Scopus databases from inception till January 20, 2024. Adhering to PRISMA guidelines, we screened and assessed the methodological quality of eligible studies, including only those of high quality. Statistical analysis included meta-analysis utilizing both random and fixed effects models to estimate pooled insomnia prevalence, accounting for variations in the study populations, and potential publication bias in the analyses using Jamovi 2.3.21.0.

Results: The literature search yielded 1,117 articles, we included nine studies that reported prevalence of insomnia cases within RA patients, incidence of new cases, or both. We identified diverse designs: three studies were cross-sectional, three were case-control studies, and three were cohort studies. Twenty-two percent of RA patients experienced insomnia, significantly surpassing the general population prevalence of 5.6%. Sample size median and range 227 (68 to 65,754). Utilizing both random and fixed effects models in our analysis, the aggregated random effects analysis revealed an insomnia prevalence of 47% (95% CI: 0.305 to 0.635) across nine studies, encompassing 70,105 patients. The pooled fixed effects estimate for insomnia prevalence was 19.0% (95% CI: 0.190 to 0.201). The fail-safe N analyses are (2851 ($p< 0.001$) and 5415 ($p< 0.001$)) for random and fixed effects models, respectively, Suggesting that the observed effect sizes are robust and unlikely to be influenced by publication bias. Global distribution showed that Sweden had the lowest prevalence (13.9%) [95% CI:0.13, 0.15] in Fixed-effect model.

Conclusion: This is the first systematic review and meta-analysis of insomnia prevalence in RA patients, revealing that RA patients are four times more likely to experience insomnia than the general population, emphasizing the need for heightened awareness among RA patients and healthcare providers. These findings highlight crucial gaps in the current understanding of insomnia in RA, advocating for further research in this area

P857

SOCIODEMOGRAPHIC DETERMINANTS OF QUALITY OF LIFE IN PATIENTS WITH CHRONIC LOW BACK PAIN: A CROSS-SECTIONAL STUDY

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Aim: To evaluate the impact of sociodemographic characteristics on the quality of life in patients with chronic low back pain.

Methods: This study included patients consulting for chronic low back pain. Sociodemographic variables such as age, marital status, gender, parenthood, educational level, occupation (unemployed, manual work, office work), and absenteeism due to illness were analyzed. Quality of life was assessed using the SF-36 score, focusing on the physical component score (PCS) and mental component score (MCS).

Results: A total of 124 patients were included, predominantly male (sex ratio: 4.4), with a mean age of 53.3 ± 13 years (range: 15–80 years) and an average duration of low back pain of 6.69 ± 4.67 years (range: 1–20 years). Most patients were married (80%), while 16% were single and 4% widowed. Educational levels were distributed as follows: 17.7% were illiterate, 32.3% had primary education, 34.7% had secondary education, and 15.3% had university-level education. Professionally, 76% were employed, including 16% in administrative positions, while 24% were unemployed. Absenteeism was reported in 6.9% of patients. Significant associations were observed between age, marital status, and PCS ($p = 0.03$ and $p = 0.015$, respectively). No significant associations were found for gender, educational level, or employment. Regarding the MCS, none of the variables showed a significant association ($p > 0.05$).

Conclusion: This study underscores the significant influence of sociodemographic factors, particularly age and marital status, on the physical quality of life in patients with chronic low back pain. These findings highlight the importance of integrating sociodemographic considerations into the comprehensive management of chronic low back pain to improve patient outcomes.

P858

ASSOCIATION BETWEEN ANXIETY, DEPRESSION, AND QUALITY OF LIFE IN CHRONIC LOW BACK PAIN PATIENTS

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Aim :
To investigate the association between the psychological impact of chronic low back pain and quality of life.
Methods: A cross-sectional study was conducted on 124 patients consulting for chronic low back pain. The psychological impact was assessed using the Hospital Anxiety and Depression Scale (HAD), and quality of life was evaluated using the SF-36 score, focusing on its physical (PCS) and mental (MCS) components.
Results: The study included 124 patients, predominantly male (sex ratio: 4.4), with a mean age of 53.3 ± 13 years (range: 15–80 years) and a mean duration of low back pain of 6.69 ± 4.67 years (range: 1–20 years).
The mean anxiety score was 8.61 ± 4.72 (range: 1–20), and the mean depression score was 8.55 ± 4.73 (range: 1–20). For anxiety, a higher frequency of symptoms was observed in patients with impaired PCS (55% vs. 30%), but the difference was not statistically significant (p = 0.121). Also, symptoms of anxiety were predominant in patients with impaired MCS (60% vs. 19% ; p<0.001)
For depression, a certain level of symptoms was more frequent in the group with impaired PCS (55% vs. 35%, p=0.197). Impairment of the MCS was significantly associated with depression, with a higher proportion of certain symptoms (60% vs. 24% ; p=0.001).
Conclusion:
This study highlights a significant association between impairment of the mental component of the SF-36 (MCS) and the presence of depressive and axiety symptoms in patients with chronic low back pain. These findings suggest that mental quality of life plays a critical role in the psychological burden of chronic low back pain, underlining the need for an integrated biopsychosocial approach in patient care.

P859

ASSESSMENT OF COMBINED PATENTED CRYSTALLINE GLUCOSAMINE SULFATE (PCGS) AND PLATELET-RICH PLASMA (PRP) INJECTIONS IN KNEE OSTEOARTHRITIS MANAGEMENT

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Introduction: Patented crystalline glucosamine sulfate (pCGS) and platelet-rich plasma (PRP) are emerging alternatives to traditional painkillers and NSAIDs for the management of knee osteoarthritis (OA). While the individual effects of both treatments have been extensively studied, the potential benefits of their combined use remain uncertain.
Objective: This study aimed to evaluate the effects of combining patented crystalline glucosamine sulfate (pCGS) with platelet-rich plasma (PRP) on knee osteoarthritis (KOA).
Methods: This study included patients diagnosed with knee osteoarthritis (KOA), classified as stages I to III according to the Kellgren and Lawrence grading system. Patients were randomized into two groups: Group A, which received a combination of patented crystalline glucosamine sulfate (pCGS) and PRP injections, and Group B, which received PRP injections only. Assessments were conducted at baseline (T0), 1 month (M1), and 3 months (M3), evaluating the following parameters: pain (VAS), neuropathic pain (DN4), and functional impairment (Lequesne index and KOOS score).
Results: A total of 48 patients with knee osteoarthritis were included in the study, predominantly female (sex ratio 0.23), with a mean age of 63 years [46-90]. The mean duration of osteoarthritis was 6.57 years ± 5.77 [1-20]. Among the participants, 11 patients (22.9%) received treatment with patented crystalline glucosamine sulfate (pCGS).
At 1 month, no significant differences were found between the "treatment" and "no treatment" groups for the following variables: VAS pain, DN4, KOOS pain, ADL, sport, quality of life (QOL), and Lequesne index. However, a significant difference was observed in the KOOS symptoms domain (p = 0.019).
At 3 months, the DN4 score showed a significant difference, with higher scores in patients receiving anti-arthritic treatment compared to those without treatment (p = 0.006). No significant differences were observed between the groups for the other variables assessed.
Conclusion: The combination of patented crystalline glucosamine sulfate (pCGS) and PRP injections did not demonstrate a significant advantage over PRP injections alone in the management of knee osteoarthritis.

P860

LOW BONE MASS IS ASSOCIATED WITH CAROTID ATHEROSCLEROSIS AND ARTERIAL STIFFNESS IN POSTMENOPAUSAL WOMEN

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Objective: to study the presence and the dynamics of associations between carotid atherosclerosis, arterial stiffness and bone mineral density (BMD) over a 10-year period.
Materials and methods: In 2022–2023, we conducted a 10-year follow-up survey of 107 women (follow-up rate: 87%). We analyzed 93 women ≥50 years without a history of cardiovascular diseases at baseline. Examinations were performed twice at the baseline and 10 years later on the 2nd visit: evaluation of the pulse wave velocity (PWV), augmentation index (AI) were carried out by applanation tonometry; the intima-media thickness (IMT), the presence and number of atherosclerotic plaques (AP) in carotid arteries were measured by B-mode ultrasonography. The BMD at lumbar spine (LS), femoral neck (FN), total hip (TH) was measured using double energy x-ray absorptiometry.
Results: During the follow–up period the rate of elevated IMT (≥0.9 mm) increased by 50% ($p<0.001$), the presence and the total number of AP increased by 22.5% ($p<0.001$) and by 45% ($p<0.001$) respectively. The rate of elevated IA ≥25% increased by 14% ($p<0.01$), while the rate of elevated PWV (≥10 m/s) did not change statistically significantly ($p=0.23$). BMD at FN has decreased by 5.3%, at TH by 3.2% ($p<0.001$), at LS by 0.8% ($p=0.09$). Age-adjusted odds ratios of developing oseopenia/osteoporosis for variables (PWV, AI, IMT, AP) and other covariates at baseline (age ≥55 years, hypertension, statins, angiotensin converting enzyme inhibitors, beta blockers, thiazide diuretics, bisphosphonates, denosumab) have demonstrated a 4.35-fold increase AP (OR = 4.35; 95% CI 1.73-10.95, p = 0.005) and a 7.17-fold increase IA (OR = 7.17; 95% CI 2.63-19.58, p = 0.001). Association of osteopenia/osteoporosis detection with such predictors as elevated PWV≥10 m/s and IMT ≥0.9 mm values were not statistically significant.
Conclusion: A 10-year prospective study showed significant changes in both vascular stiffness, subclinical AS and bone mass in postmenopausal women and confirmed the temporal relationship of the association of IA and carotid atherosclerosis with low bone mass, which allows us to consider these variables as common early markers of osteoporosis and atherosclerosis for stratification of a high risk of combined development of these diseases.

P861

ADDRESSING THE UNMET CHALLENGE OF PAIN IN RARE BONE DISEASES

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Introduction: Pain is a common symptom in many rare bone disorders, often linked to depression and a substantial decline in quality of life. However, there is little information on the quality of the pain as this may provide insights into pain mechanisms.
Objectives : To describe the self-reported frequency and characteristics of pain in adults withFibrous Dysplasia of Bone/McCune-Albright Syndrome (FD/MAS), Osteogenesis Imperfecta (OI), and X-linked Hypophosphatemia (XLH).
Methods: A retrospective cross-sectional study was conducted using the online UK-based RUDY registry. Adults with FD/MAS, OI, and XLH who were registered in the RUDY registry and completed the painDETECT questionnaire (PD-Q) at baseline were included. Pain prevalence and pain phenotypes were assessed based on baseline PD-Q results. WPI-score calculated from PD-Q pain mapping. Descriptive statistical analyses were performed using R®.
Results: 281 adults completed the PD-Q at baseline : 94 patients with FD/MAS, 94 with OI, and 93 with XLH. Of these, 86% experienced pain currently, 47% described their strongest pain as severe (≥8/10) in the past four weeks and 18% had generalized pain,with no difference between the three conditions. Pain phenotype and evolution profiles were similar, while pain sites differed between the three conditions. 21% of patients reported uncategorized pain.
Conclusion: Despite differences in the mechanisms underlying these bone diseases, the prevalence and main characteristics of pain appear similar, suggesting that a significant portion of the pain may be determined by bone-independent factors. The high prevalence of generalized and uncategorized pain in these three rare bone diseases suggests the presence of nociplastic features, which require further investigation.
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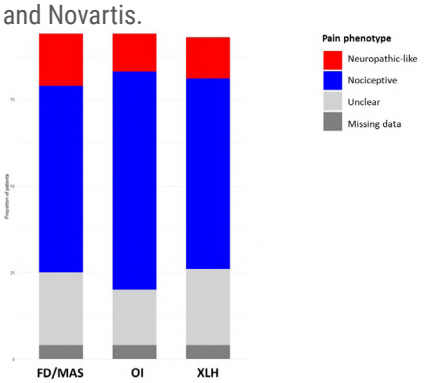

P862

SILENT THREAT : DECODING FRAGILITY FRACTURES OF PELVIS. A CASE REPORT

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Introduction Fragility fractures of the pelvis, a formidable challenge in the realm of orthopedics, present a silent yet pervasive threat to the well-being of an aging population.

Material and Methods Here we presented a case report on the challenges commonly faces in diagnosis of fragility fracture of the pelvis. Our patient who was an 83-year-old woman, presented with pain over left hip. inability to sit and ambulate following a slip and fall. Initial assessment by junior doctors missed the diagnosis of fragility fracture pelvis as the plain radiographs showed only a minor fracture over the left superior pubic ramus [Figure 1]. Upon further evaluation, patient was unable to ambulate despite a period of observation and analgesic treatment. Thus, computed tomography of pelvis was obtained which complete fracture of the left iliac crest correspond to Rommens Classification Type IIb [Figure2].

Figure 1: Plain Radiograph Pelvis and Hip

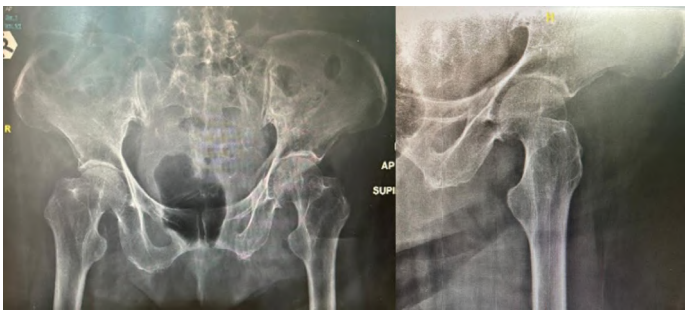
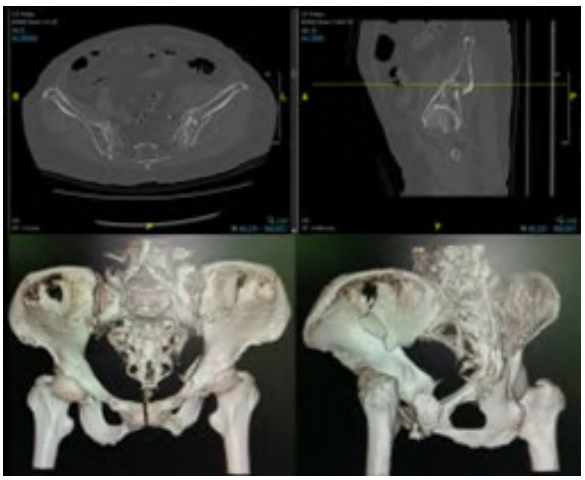


Figure 2: CT Pelvis with 3D Reconstruction show Rommens Type IIb Fracture of Iliac crest and superior pubic rami fracture



Results Patient underwent minimal invasive percutaneous screw fixation over the iliac crest and immediately next day patient able to sit and ambulate with wheelchairs. Visual Analog Score (VAS) reduce from 8 to 3 immediate post operatively. patient able to back to ambulation independent at 3 months post operative with no further dissociation of pelvic ring.

Conclusion Fragility fractures of pelvis are a silent threat to the well-being of the elderly population, easily missed and pose a significant challenge in diagnosis and management.

P863

PATELLAR CANNULATED SCREW FIXATION WITH SUTURE TAPE AUGMENTATION IN ELDERLY PATIENT: CASE SERIES

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Introduction

Patellar fractures are common injuries, accounting for approximately 1% of all skeletal fractures. Obtaining a stable anatomic reduction and maintaining it during the perioperative period is critical for restoring function, particularly in the elderly population with osteopenic bone [1]. Various fixation techniques have been described, including tension band wiring, cannulated screw fixation, and plate fixation.

Tension band wiring is a commonly used technique but poses challenges in comminuted fractures or osteopenic bone. The failure rate of tension band wiring has been well-documented in the literature. Plate fixation offers more rigid fixation but can be challenging due to the patella's subcutaneous location. Recently, cannulated screws with suture tape augmentation have been proposed as an alternative technique to improve fixation in osteoporotic bone [2].

Methods We present a case series of six elderly patients with patellar fractures treated with cannulated screw fixation and suture tape augmentation. The mean age of the patients was 68 years (range: 64–73). Only patients aged >60 years with transverse fractures were included. All patients underwent open reduction and internal fixation with cannulated screws and suture tape augmentation. They were evaluated for KSS scores at four months postoperatively and monitored for complications up to one year of follow-up.

Surgical Technique A standard midline longitudinal incision was made over the patella. The fracture site was exposed and anatomically reduced using a malleolar clamp. Two guidewires for 4.0 mm cannulated screws were introduced from the inferior part of the patella to the superior pole, ensuring both wires were parallel and centred.

The tip of each guidewire was placed at the second cortex, and the screw length was measured. The wires were further advanced into the quadriceps tendon. Half-threaded 4.0 mm stainless steel cannulated screws with washers were used for fixation in all cases [Figure 1].

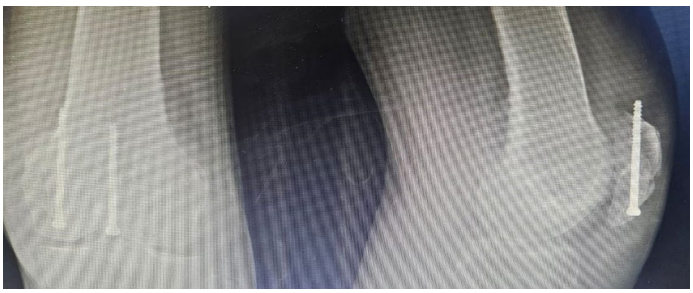

Figure 1: Cannulated screw with washer insertion

The screw threads passed the fracture line to engage the second cortex. Fibre suture tape was passed through the cannulated holes using a wire passer and secured in a horizontal figure-of-eight pattern [Figure 2].

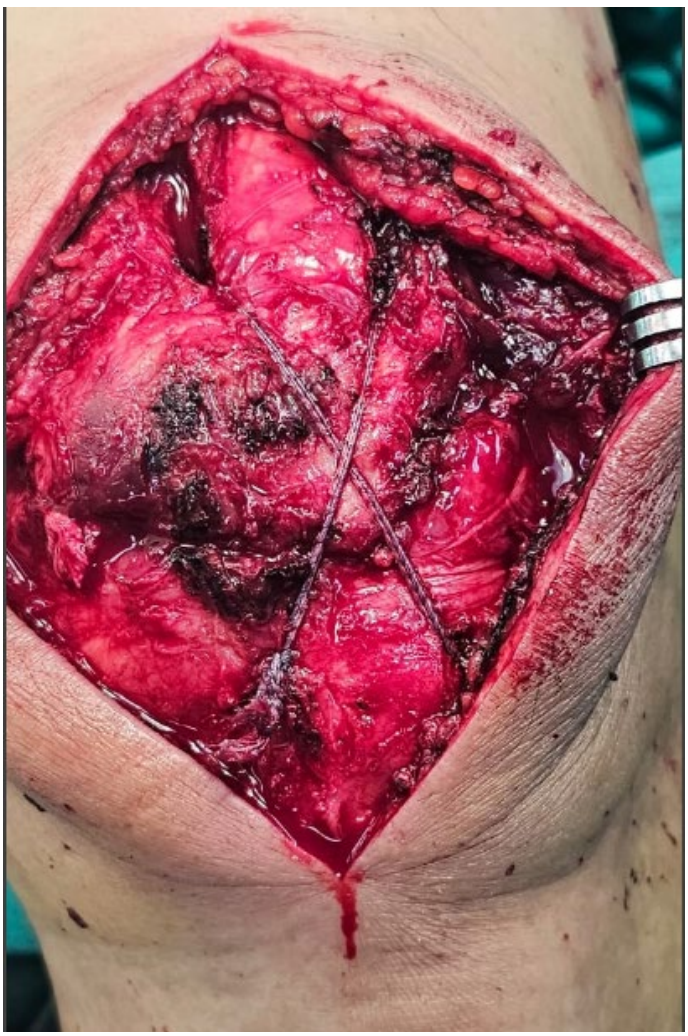

Figure 2: Fiber suture tape was tightened in a horizontal figure-of-eight manner

The retinaculum was repaired, and the wound was closed in layers. Postoperatively, patients were protected with a cylinder slab or knee brace for two weeks until the wound healed and were allowed weight-bearing as tolerated. Full range of motion exercises commenced two weeks postoperatively.

Results

All six fractures healed without complications such as infection, nonunion, or hardware failure [Table 1]. The average operation time was 40.5 minutes. Radiographic union occurred within 8–12 weeks (mean = 8.67 weeks). No patients required revision surgery or hardware removal at the one-year follow-up. None reported complaints related to prominent implants or pain during kneeling. Most patients achieved >100° knee flexion [Figure 3]. The KSS at four months ranged from 87 to 97 (mean = 91).

Patient	Age	Gender	Operation Time, min	Union Time, weeks	Complication at 1 year follow up	ROM knee at 4 months	KSS 4 months
A	64	male	40	8	nil	0-110	92
B	68	male	50	10	nil	5-100	87
C	70	female	36	8	nil	0-105	95
D	73	male	39	8	nil	0-110	96
E	65	female	38	8	nil	0-110	97
F	68	male	40	10	nil	0-105	91

Table 1: Patient Data on Operation Time, Union Time, Complication, ROM knee and KSS at 4 month.

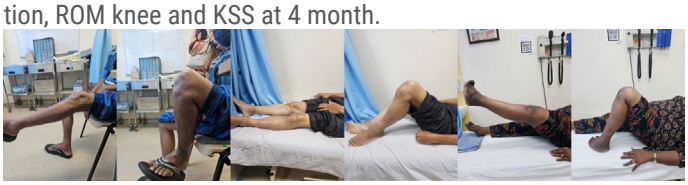

Figure 3: ROM knee at 4 months of the procedure.

Discussion

Patellar fractures, which represent approximately 1% of all skeletal fractures, pose significant challenges, particularly in elderly patients [3]. The diminished bone quality in this population necessitates robust fixation techniques to ensure optimal healing and functional restoration. Our case series of six elderly patients treated with cannulated screw fixation augmented with suture tape highlights the potential of this technique in achieving favourable outcomes.

The modified tension band wiring (TBW) technique is a widely used approach but has several limitations, especially in cases of comminuted fractures or osteopenic bone. TBW can be technically challenging and is associated with complications such as loss of reduction, implant failure, and the need for subsequent hardware removal [4-6]. Plate fixation offers more rigid fixation but can be difficult due to the subcutaneous location of the patella and the risk of complications like skin irritation and infection.

Oyama et al. [7] conducted a retrospective multicenter study to identify predictors of postoperative complications associated with TBW in patellar fractures. Their analysis revealed that bending only one end of the Kirschner wires significantly increased the risk of implant migration. Additionally, a larger ratio between the patella size and the tension band and a wider distance between the K-wires were identified as risk factors for implant breakage. Notably, the study did not find significant risk factors for loss of reduction. These findings underscore the importance of meticulous surgical technique in TBW, emphasizing the proper bending of both K-wire ends and the precise placement of the tension band and K-wires to mitigate postoperative complications.

While conservative management may suffice for certain patellar fractures, surgical intervention is often warranted, particularly in displaced or comminuted fractures [8]. The choice of surgical technique depends on factors such as fracture pattern, bone quality, and surgeon preference. Traditional methods like TBW, while widely used, are associated with complications such as wire migration, breakage, and painful hardware, leading to reoperation

rates as high as 4.2% [6,7]. These limitations of TBW in osteoporotic bone underscore the need for alternative fixation strategies. The modified TBW technique, often employing cannulated screws, has gained popularity [2]. However, challenges remain in achieving and maintaining anatomical reduction, particularly in comminuted fractures. Plate fixation provides greater stability but presents technical difficulties due to the patella's subcutaneous location [1]. Our approach, which utilizes cannulated screws with suture tape augmentation, aims to enhance fixation strength while minimizing hardware-related complications.

As described by Monaco et al., the suture tape cerclage technique provides additional support and may reduce the risk of displacement, particularly in osteoporotic bone [9]. Additionally, the two-tension-band technique described by Xue et al. for revision surgery offers a valuable salvage option in cases of fixation failure [10].

Our results demonstrate uncomplicated healing and good functional outcomes in all six patients, suggesting the efficacy of cannulated screw fixation with suture tape augmentation. The absence of hardware-related complications and satisfactory KSS scores at four months are encouraging. However, larger studies with longer follow-ups are needed to validate these findings and compare this technique with other established methods. Further research should also explore the biomechanical properties of suture tape augmentation and its impact on fracture stability.

Conclusion

Cannulated screw fixation with suture tape augmentation is a promising technique for managing patellar fractures in elderly patients. This approach achieves stable fixation, promotes healing, and restores function while minimizing complications. Further research is warranted to validate these findings and determine the optimal role of this technique in clinical practice

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P864

INITIATION OF THERAPY FOR POSTMENOPAUSAL OSTEOPOROSIS WITH COMPENSATED HYPOTHYROIDISM

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Objectives. To study the features of the primary diagnosis and therapy of postmenopausal osteoporosis (PMO) in women with compensated hypothyroidism.

Materials and methods. 46 women with thyroid pathology (thyroid gland) were examined (average age 65.2±4.1 years). A comprehensive clinical examination was performed (examination of thyroid function, ultrasound examination of thyroid, X-ray osteodensitometry (ODM), study of phosphorus-calcium metabolism).

Results. As a result of the studies, in 42.5% of cases, there was a multi–nodular goiter; single-nodular goiter - in 20%, autoimmune thyroiditis with compensated hypothyroidism – in 37.5%. Subclinical hyperthyroidism – 3 cases, amiodarone-induced hypothy-

roidism – 1 case. 35 patients were diagnosed with PMO.
Levothyroxine in doses from 25 to 112.5 micrograms was administered to 15 women (32.6%), with an average thyroid–stimulating hormone (TSH) level of 2.61±1.47 micrograms/ml. The average body mass index (BMI) is 25.12±3.51 kg/m2. The age of natural menopause was 45.8±5.1 years (n=31), and the age of surgical menopause was 43.0±1.41 years (n=4).
Fasting glucose – 5.22±0.35 mmol/L, HbA1c – 5.51±0.14%, total calcium – 2.45±0.071 mmol/L, ionized – 1.26±0.05 mmol/L. Vitamin D deficiency – 3 cases, deficiency – 5 cases.
ODM, average T-test values: axial skeleton – - 2.57±0.79 (median -2.69), left hip – -1.92±0.90 (median -2.0), neck – -1.95±0.97 (median -1.95), left forearm – -3.07±0.97 (median -3.1).
10-year fracture risk from 8.31 to 13.9% (average 11%). The hereditary history of fractures is not burdened.
The average age at the time of detection of PME was 61.7±5.2 years. Denosumab, calcium supplements 1000 mg per day, vitamin D were immediately prescribed, and recommendations on diet and physical activity were given.
Conclusions. PMO was detected at target TSH values against the background of levothyroxine compensation for hypothyroidism. This indicates the need for an active approach to the diagnosis of osteoporosis, regardless of TSH levels.

P865

ASSESSMENT OF SARCOPENIA IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE USING ULTRASOUND MUSCLE IMAGING

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Objectives. To evaluate the muscle mass of patients with inflammatory bowel disease (IBD) through ultrasound (US) imaging.
Materials and Methods. A total of 72 patients with IBD and 12 in the control group (CG) were included in the study. The mean age of patients was 37.5 [27; 48] years, and in the CG, it was 37.75 [26.0; 49.5] years. In the IBD group, there were 39 females (54.1%) and 33 males (45.9%); in the CG, there were 5 females (46.1%) and 7 males (53.9%). The following parameters were assessed: body mass index (BMI), mid-arm circumference (MAC), mid-thigh circumference (MTC); grip strength (age- and sex-specific norms); ultrasound measurements of mid-arm thickness (US-MAT) and mid-thigh thickness (US-MTT); and skeletal muscle mass (SMM) via bioimpedance analysis.
Results. The majority of patients had a normal body mass (55%), while 10% had a deficiency; 22% were overweight, and 13% were obese. A reduction in MAC was observed among women with IBD in 11 (29%) cases and in 4 (11%) cases for men; however, no statistically significant differences were found when compared to the CG. The MTC measurements were lower in women (53.25 [48; 58.5] cm, p <0.05) and men with IBD (48.7 [46; 51.4] cm, p >0.05) compared to the CG (60.5 [55; 66] cm and 49 [45; 53] cm, respectively). Grip strength of the dominant hand was reduced in 11% of women and 12% of men with IBD, with no differences identified when compared to the CG.
The US-MAT measurements in women (21.06 [18.36; 23.76] mm) and men (24.79 [21.41; 28.17] mm) with IBD did not differ from the CG. However, the US-MTT in women with IBD (29.09 [24.52; 33.67] mm) was lower compared to the CG (37.63 [34.54; 40.73] mm, p <0.05), as was the case for men with IBD (31.86 [24.75; 38.97] mm vs 38.76 [36.67; 40.89] mm, p <0.05). US-MAT correlated with SMM (r=0.62; p <0.05) and muscle strength (r=0.50; p <0.05). US-MTT correlated with BMI (r=0.43; p <0.05), SMM (r=0.32; p <0.05), US-MAT (r=0.465; p <0.05), and muscle strength (r=0.24; p <0.05).
Conclusion. In patients with IBD, the MTC in women was lower than in the CG. The values of US-MTT in both women and men with IBD were lower than in the CG and correlated with BMI, SMM, and muscle strength.

P866

VITAMIN D DEFICIENCY IN PATIENTS WITH RHEUMATIC DISEASES

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Цели. Оценить распространенность гиповитаминозов и дефицита витамина D у больных ревматическими заболеваниями (РЗ).
Материалы и методы. В исследование включены 86 пациентов с РЗ и 27 лиц того же возраста без воспалительных РЗ. У пациентов с РЗ диагностированы системная склеродермия (ССД) – 51 человек, псориатический артрит (ПсА) – 15 человек и ревматоидный артрит (РА) – 20 пациентов. Забор крови производился в осенне-зимний период. Концентрацию витамина D (25(OH)D) в сыворотке крови определяли с помощью иммунохемилюминесцентного анализатора.
Результаты. Средняя концентрация 25 (OH)D составила 19,83±11,06 нг/мл у пациентов с ССД, 19,27±9,25 нг/мл у пациентов с ПсА, 16,87±7,35 нг/мл у пациентов с РА и 24,31±7,63 нг/мл в контрольной группе. Уровень 25 (OH)D был значительно ниже у пациентов с ССД и РА по сравнению с контрольной группой (p=0,033 и p<0,001 соответственно).

Не было обнаружено существенных различий в уровнях витамина D между пациентами с ПсА и контрольной группой. Среди всех обследованных лиц только 23% лиц без РЗ и 25% пациентов с ПсА имели нормальные уровни (≥30 нг/мл) 25(OH)D в сыворотке, что было значительно выше, чем проценты в группах РА и ССД (7% и 11% соответственно). Гиповитаминоз D (≥20–<30 нг/мл) был диагностирован у 19% пациентов с РА, 24% пациентов с ПсА, 33% пациентов с ССД и 42% в контрольной группе, в то время как дефицит витамина D (<20 нг/мл) наблюдался у 71%, 47%, 57% и 25% лиц соответственно. Не было обнаружено существенных различий в уровнях 25(OH)D в сыворотке между лицами моложе и старше 65 лет, а также по индексу массы тела (ИМТ). Среди лиц с РЗ, у которых по данным денситометрического исследования был выявлен остеопороз, у 83% был выявлен дефицит витамина D, что встречалось значительно чаще, чем у лиц с остеопенией или нормальной минеральной плотностью костной ткани (80% и 71% соответственно, p<0,04).

Заключение . Дефицит и недостаточность витамина D были обнаружены с высокой частотой как в группе RD, так и в контрольной группе. Дефицит 25(OH)D был значительно более распространен у пациентов с RA и SSc, а также у пациентов с остеопорозом, независимо от конкретного диагноза ревматического заболевания.

P867

USE OF GENE-ENGINEERED THERAPY, BISPHOSPHONATES, CALCIUM, AND VITAMIN D3 IN THE TREATMENT OF PATIENTS WITH RHEUMATOID ARTHRITIS

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Objective. To evaluate the efficacy of a combination of bisphosphonates with vitamin D3 on bone mineral density (BMD) in patients with rheumatoid arthritis (RA) at radiological stages II-III, receiving gene-engineered biological therapy (GEBT) via densitometry.

Materials and Methods. The study was conducted on 60 women (aged 46-49 years, 48 ±2.4) with confirmed RA diagnosis (according to ARA/EULAR 2010 classification criteria), presenting high activity levels (DAS 28: 5.5±3.00) and a disease duration of 13.4 ±3.5 years. The second radiological stage was noted in 35 subjects (58.2%), and the third stage in 25 (41.8%).

27 patients (45%) received GEBT: infliximab (20), adalimumab (3), tocilizumab (4). BMD assessments were conducted monthly using X-ray osteodensitometry.

Results. According to X-ray osteodensitometry, osteoporosis was present in 39 patients (64.1%), normal values in 12 (19%), and osteopenia in 10 (17.2%) prior to GEBT. The average BMD was measured at 0.691±0.05 g/cm².

To prevent secondary osteoporosis, bisphosphonates were prescribed: alendronate (59.2%), ibandronate (27.3%), and zoledronate (13.5%), along with calcium and vitamin D3 supplements. After one year, BMD increased to 0.704±0.008 g/cm² (p=0.002), with osteoporosis prevalence at 49.1%. BMD increased by 1.4%.

After two years, BMD was measured at 0.714±0.010 g/cm² (p=0.0001). Osteoporosis prevalence reached 47.3%, and osteopenia was present in 26.2% of cases.

Over the next three years, no signs of secondary fractures were observed, achieving a stable bone mineralization level (averaging 0.9%). RA activity also decreased (DAS 28: 3.1±0.8 points).

Conclusion. Gene-engineered therapy combined with agents that enhance bone metabolism (bisphosphonates, calcium, and vitamin D3) contributes to the remission of RA and prevents secondary fractures by stabilizing bone mass.

P868

GENDER-SPECIFIC ASSOCIATIONS OF MUSCLE STRENGTH AND FRAILTY IN OLDER ADULTS

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Objective: Frailty, linked to sarcopenia and musculoskeletal decline, increases vulnerability to falls, fractures, and loss of independence. Frailty is more common in females, yet gender-specific lower limb muscular strength related determinants of frailty remain understudied. This study examined the relationship between specific lower-body muscle strength and frailty status while evaluating gender-based differences.

Methods: Eighty-two older adults (mean age: 70.3±10.2 years; 59.8% female) were classified as non-frail (SPPB > 10) or pre-frail/frail (SPPB ≤ 10). Maximal isometric strength was assessed for right-sided hip abductors (HA), hip lateral rotators (HLR), knee extensors (KE), ankle dorsiflexors (ADF), and ankle plantar flexors (APF). Logistic regression models evaluated frailty odds based on muscle strength, adjusted for age and gender. Gender interactions were also tested.

Results: Ankle plantar flexor strength showed a significant interaction with gender (p=0.026). Among females, each 1 kg increase in APF strength reduced frailty odds by 9.4% (OR=0.906, 95% CI:0.844–0.972, p=0.006), while this effect was not significant in males (p=0.610). Hip abductor strength demonstrated a significant effect across both genders (p=0.033). Each 1 kg increase in HA strength reduced frailty odds by 9.1% (OR=0.909, 95% CI:0.833–0.992). For other muscle groups, neither the main effects nor the interactions with gender reached significance. Hip lateral rotator strength (main effect: p=0.814; interaction: p=0.767), ADF strength (main effect: p=0.484; interaction:

p=0.179), and KE strength (main effect: p=0.054; interaction: p=0.841) did not exhibit meaningful impacts on frailty odds.
Conclusion: These findings reveal gender-specific predictors of frailty, with APF strength playing a key role in females and HA strength reducing frailty risk across genders. This suggests that muscle-specific training programs could be designed to address frailty risk effectively. Targeted strengthening of APF in females and HA across all individuals could form effective clinical interventions. Maintaining and strengthening the identified muscle groups may contribute to preventing frailty from developing. Such targeted interventions can enhance musculoskeletal health and support independence in older adults.

P869

SUCCESSFULNESS OF TELEMEDICINE IN THE MANAGEMENT OF GERIATRIC PATIENTS AT HIGH RISK OF FRAGILITY FRACTURES

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Objectives: Telemedicine may improve the monitoring of patients with chronic diseases. Secondary prevention of fragility fractures is an urgent matter to be addressed by means of available technology, although supported by little evidence so far. We investigated the feasibility, efficacy, and satisfaction of managing older adults at high risk of fragility fractures during the COVID-19 lockdown.
Material & Methods: From January to July 2021, a prospective observational study for safety and adherence purposes was conducted among older patients (n=407) with ongoing treatments for secondary prevention of fragility fractures. The study procedures observe national and regional resolutions related to telemedicine service (TS), including equipment, staff behaviours, and patient reports.
Results: A majority (86.48% [n = 352]) of the eligible patients participated in remote visits, mainly women (88.2%), 81.4 ± 8.8 years of age, 49.6% independent in 5 out of 6 BADL, despite high comorbidity (4.9 ± 1.5), and polypharmacy (4.9 ± 3.1). Almost all were on second-line antifracture treatments (95.58%) due to previous major (84.03%) and minor (42.5%) fragility fractures.
About 58% reported good and very good reliability of the internet network, allowing easy access to the TS platform, and 54% declared the degree of satisfaction with TS as good and very good. Regarding the clinicians, about 75% of them acknowledged the efficacy of TS and expressed willingness to recommend the use of TS to colleagues. Ultimately, 68% of specialists defined the time dedicated to patients' remote visits as acceptable.
Conclusion: TS may be a chance to increase the availability of appropriate healthcare services to satisfy patients' needs and optimize healthcare resource allocation.

P870

CALCIUM INTAKE AND BONE MINERAL DENSITY (BMD): IS THERE A CORRELATION BETWEEN THEM IN A SPONDYLOARTHRITIS CONTEXT?

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Objective: To assess the relationship between calcium deficiency, as measured by the test "how to know if you lack Calcium" carried out by GRIO, and bone mineral density in patients with spondyloarthritis.
Methods: This was a cross-sectional study involving patients followed for spondyloarthritis (SpA), according to the 2009 ASAS criteria. The study was conducted over a 3-month period (Novembre 2024 to January 2025). Socio-demographic and clinical data were collected.
Daily calcium intake was assessed using the test "how to know if you lack Calcium" which evaluates mainly the calcium provided by dairy products (6 categories) Milk ,cheese sandwich or cheese soufflé, cheese, yogurt, white cheese, Flan or rice pudding or cream dessert. The calcium deficiency is defined by a score less than 10 points. Bone mineral density (BMD) was measured using dual-energy X-ray absorptiometry (DEXA) at the lumbar and femoral sites. Data analysis was performed using SPSS software. Results were considered statistically significant if the p-value was less than 0.05.
Results: Thirty patients were included in the study. The male-to-female ratio was 14 (28 men and 2 women). The mean age was 40,07 years (range: 23–62 years). The mean age at disease onset was 34.25 years (range: 18–62 years). The average disease duration was 6.1 years. The SpA phenotypes were distributed as follows: axial SpA (n=16), axial and peripheral SpA (n=10), arthritis associated with inflammatory bowel disease (n=3), and SAPHO syndrome (n=1). The mean lumbar spine T-score was -1,5724 SD, and the mean femoral T-score was -1,2496 SD. Bone mineral density was 1.417 ± 00,185 g/cm² at the lumbar spine and 0.916 ± 0.137 g/cm² at the femur. Ten patients had normal BMD, while 20 patients presented reduced BMD (osteopenia in 7 patients and osteoporosis in 13 patients). 23 patients out of 30 had calcium deficiency. There was no statistically significant correlation in bone mineral density between the two groups of patients (p=0,407).
Conclusion: The absence of correlation suggests that other factors, such as physical activity, hormonal levels, or calcium absorption issues, may have a greater impact on bone mass than calcium intake alone. It could also indicate that calcium, on its own, is not sufficient to significantly influence bone density without the presence of these additional factors.

P871

PERCEPTION OF RHEUMATIC PATIENTS REGARDING THE USE OF COMPLEMENTARY AND ALTERNATIVE MEDICINE (CAM)

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Introduction: Rheumatic patients appear to be high users of complementary and alternative medicine (CAM).
The **aim** of our study was to understand their perceptions regarding the use of CAM to better adapt care and integrate these practices in a safe manner.

Patients and Methods: This is a cross-sectional descriptive study involving patients with inflammatory rheumatic diseases , including rheumatoid arthritis (RA), spondyloarthritis (SPA), and degenerative diseases. A questionnaire was developed to collect sociodemographic, clinical, and paraclinical data from each patient.

Results: Forty-one patients were included in the study, 26 men and 15 women, with an average age of 47 years [21-77]. The diagnoses were SPA in 43.9%, degenerative disease in 39%, and RA in 17.1% of cases. Twenty-eight patients had already used CAM to treat their symptoms. The primary motivations for using CAM were the perception of it being a natural and safer option, as well as a complement to conventional treatment. Dissatisfaction with conventional care was reported in 10.3% of cases. Most patients did not disclose their use of CAM to healthcare professionals. Reasons for non-disclosure included not being asked by the doctor and fear of receiving a negative response. The most commonly used modalities were therapeutic massage (65.5%) and cupping therapy (58.6%). Acupuncture (10.3%) and herbal medicines (6.9%) ranked second. However, some practices, such as meditation, chiropractic care, energy healing, and homeopathy, were never used. Twenty-five patients had discussed complementary and alternative therapies with their doctor. In 80% of cases, healthcare professionals showed a positive attitude towards certain CAM modalities, particularly therapeutic massage. Regarding efficacy, 4 patients reported that CAM had a very beneficial effect, while 16 felt its impact was moderate. However, 4 patients rated its effectiveness as low, and 5 reported no effect. According to patients, the main disadvantages of CAM, in order of frequency, were: lack of scientific evidence on efficacy (27.8%), unknown side effects (27.8%), risk of interaction with conventional medications (11.1%), and high costs (8.3%). However, half of the patients noted no disadvantages to its use. The majority of patients (38) believed that healthcare professionals should provide more information on the effectiveness and safety of CAM. Opinions were divided on whether CAM could replace conventional treatments: 3 patients thought this was possible, 22 disagreed, and 15 favored a combined approach of CAM and traditional treatments.

Conclusion: Our study illustrates the positive perception of patients regarding complementary and alternative medicine (CAM), particularly cupping therapy. Healthcare professionals should expand their knowledge of CAM to better understand its potential benefits and integrate these approaches into a comprehensive management plan for patients.

P872

JOINT DISORDERS IN PATIENTS WITH ACROMEGALY: PHYSICIAN AWARENESS AND ACCESS TO HEALTHCARE SERVICES

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Objective: We present a study aimed at analyzing the prevalence of joint pain complaints among patients with acromegaly, as well as the awareness of various specialists regarding the necessity of actively identifying musculoskeletal complaints. The study also examines the potential for routing patients to specialized professionals, such as orthopedic surgeons and maxillofacial surgeons, and the implementation of rehabilitation programs. Arthropathy associated with acromegaly is recognized as a common and significant complication that contributes to morbidity and functional impairments in patients with acromegaly. Given the advancements in the treatment of acromegaly, which allow the majority of patients to achieve remission, the diagnosis and rehabilitation of associated complications have become of paramount importance.
Material and Methods: National survey of physicians of various specialties using online questionnaire.
Results: According to the conducted study involving 171 specialists, the majority of participants are endocrinologists (81.9%), other specialties included dentists (7.6%), pediatric endocrinologists (4.7%), maxillofacial surgeons (11.75%), and physicians of other specialties (4.1%). Among the respondents, 67.8% noted that patients with acromegaly experience damage to the musculoskeletal system, with the spine being the most commonly affected (39.7%) followed by the temporomandibular joint (TMJ) (32.1%). It is noteworthy that patients themselves report complaints of pain in the knees and hips (63.1%), in the spine (46.1%), as well as pain in the ankles, shoulders, and elbows (16.3% each). Specialists conduct differential diagnoses with rheumatological diseases through laboratory tests in 57.8% of cases. Experts note that 33.9% of patients report active complaints of pain in the TMJ. At the same time, 34.5% of physicians do not specifically inquire about the presence of pain or limitations in movement in the TMJ for patients with acromegaly. Only 11.1% of doctors have the opportunity to refer patients with musculoskeletal disorders to rehabilitation specialists.
Conclusion: The results we obtained show that the issue of mus-

culoskeletal system damage in patients with acromegaly (diagnosis, treatment, and rehabilitation) remains highly relevant and show the need for further development of the studies which will become the basis for improving patient routing and expanding diagnostic capabilities and subsequent rehabilitation.

P873

MAXILLOFACIAL MANIFESTATIONS OF PITUITARY ADENOMAS

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Objective: We present a research study aimed at evaluating the prevalence of functional disorders associated with acromegalic maxillofacial changes and their impact on key health parameters. Acromegaly is a rare disorder caused by the hypersecretion of growth hormone, leading to characteristic craniofacial region (CFR) changes. These changes include mandibular overgrowth, maxillary expansion, increased interdental gaps, and subsequent bite abnormalities. Beyond their aesthetic implications, these maxillofacial alterations can have significant functional and health-related consequences.

Materials and Methods: A single-center, controlled, questionnaire-based study was conducted involving 30 patients diagnosed with acromegaly (median age: 47 years [39; 54], 43.3% male) and 18 patients with hormone-inactive pituitary adenomas (median age: 47 years [38; 57], 22.2% male). All participants were evaluated at the Department of Neuroendocrinology of Endocrinology Research Centre.

Results: Significant differences were observed between patient groups in the following areas: visual changes related to CFR (1 [0;2] vs 0 [0;0], p=0.004), speech and diction changes (0 [0;1] vs 0 [0;0], p=0.02), and feelings of depression associated with CFR (0 [0;1] vs 0 [0;0], p=0.04) in the acromegaly and non-acromegaly groups, respectively. In the acromegaly group, patients reported a significant correlations (p<0.05) between speech and diction impairments and drug therapy (r = 0.37), as well as health status over the past year (r = 0.46 and r = 0.44), quality of life during the last year with achieved IGF-1 levels (r = 0.51 and r = 0.49), disease duration, and duration of decompensated state. These parameters did not correlate with age, number of surgical interventions, or achieved IGF-1 levels.

Conclusions: Acromegaly is associated with a high prevalence of functional disorders and cardiovascular complications, significantly impacting patients' health and quality of life. Early diagnosis, normalization of IGF-1 levels, and targeted interventions to address craniofacial changes are essential to improving the quality of life for individuals with acromegaly.

P874

A SUB-COHORT CROSS-SECTIONAL ANALYSIS OF PATIENTS WITH OSTEOPOROSIS AND ANOREXIA NERVOSA AND THEIR RISK OF FRAGILITY FRACTURE

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Objective Anorexia nervosa is defined by a persistently low body weight resulting from restricted energy intake, an intense fear of gaining weight or persistent behaviour that prevents weight gain, and a significantly disturbed self-perception of body weight or shape (*International Classification of Diseases, 11th Revision)*. Data on bone heath in cohorts with anorexia nervosa is sparse. This sub-cohort analyses reviewed patients between June 2004 and Nov 2019 aiming to determine whether low body fat and all FRAX risk factors are associated with increased fracture risk in a cohort of patients with Anorexia Nervosa.

Materials and Methods A retrospective study of patients for this sub-cohort was taken from a master data set of patients with Osteoporosis and all those with a formal diagnosis of Anorexia Nervosa were included in this data set. In total 467 patients were included in the analyses. Those with and without a fragility fracture had their risk factors as determined by FRAX compared. Body fat percentage was also examined as a stand-alone variable considering the patient population. Statistical analyses was performed using R programming language, with t-test or Kruskal-Wallis for continuous variables and Fisher's exact test for categorical variables. For categorical variables data is presented as mean (SD). Statistical significance was classified as a p-value <0.05.

Results The cohort included 179 patients with fractures and 287 patients with no fracture. Risk factors with a statistically significant difference between the groups were: Low femoral neck BMD, low fat percentage (33.3% (11.2) vs 30.1 (10.5)), previous fracture (10.6% vs 0.35%), family history (39.7% vs 25.4%), previous steroid therapy (11.7% vs 3.48%) and alcohol use (19% vs 8.71%). Smoking, history of rheumatoid arthritis and secondary osteoporosis did not achieve statistical significance. The risk factors with strongest association with fracture in the anorexia cohort were previous fracture, total fat percentage and previous steroid therapy.

Conclusion Not all FRAX risk factors were associated with fractures in this cohort of patients. Low body fat percentage was associated with an increased risk of fractures in a population of patients with Anorexia Nervosa and should be considered in screening for risk of fracture in this cohort.

Disclosures

None

P875

X-LINKED HYPOPHOSPHATEMIC RICKETS IN ADULTS: INSIGHTS FROM A SINGLE-CENTER CASE SERIES

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X-linked hypophosphatemic rickets (XLH) is a rare hereditary disorder caused by inactivating mutations in the PHEX gene, leading to FGF23-mediated renal phosphate loss. This study aims to describe the characteristics and therapeutic approaches in a historical cohort of adult XLH patients.

Methods: Retrospective observational analysis. Medical records of patients with osteomalacia assisted in our center between 2005 and 2022, including 22 adult patients diagnosed with XLH.

Results: The cohort comprised 82% females, with a median age of 45 years (range: 25–78). Median height was 1.49 m (IQR:1.42–1.55), BMI 25.2 kg/m² (IQR: 22.9–27.8). Median age at diagnosis was 2 years (IQR: 2–5), with 4 cases diagnosed in adulthood. Sixteen patients (73%) reported a family history of XLH. Manifestations included lower limb deformities(73%), bone pain(23%) and osteoarthritis(41%). Skeletal deformities were genu varum/valgum(73%), craniosynostosis(18%) and scoliosis(18%). Eight patients sustained 17 fractures, including femoral (41%) and pseudofractures (14%). Dental pathology affected 59%, nephrocalcinosis 14% and hearing loss 18% patients. Bone mineral density was normal in 80% of 16 evaluated cases.

Treatment included phosphate salts and calcitriol in 12 patients (55%) and only calcitriol in 6 (27%). Two patients transitioned to burosumab due to intolerance to phosphate salts, achieving improvement. Table 1 shows treatment improves TmP-GFR. Corrective orthopedic surgeries were performed in 73% of patients.

Conclusion: Our findings underscore the disease burden in adult XLH patients. Early diagnosis and multidisciplinary management are crucial to mitigate complications and enhance patient outcomes. Future efforts should focus on establishing a XLH registry to facilitate better disease monitoring and care standardization.

Table: Laboratory finding in patients with and without treatment

	Ref. range	Unit	No treatment	Treatment	p*
N.			14	18	
Serum Phosphate	2.5-4.5	mg/dl	2 (1.7-2.3)	2.2 (2-2.5)	0.29
TRP	>85	%	71 (64-75)	77 (66-82)	0.39
TmP-GFR	2.6–3.8	mg/dl	1.5 (1.2-1.6)	1.8 (1.3-2.1)	0.02
ALP	30-100	IU/l	96 (74-123)	109 (90-109)	0.44
PTH	15-65	pg/ml	90 (66-127)	80 (73-100)	0.69

Note: median (first quartile-third quartile) * Wilcoxon sign rank test paired comparisons in 12 cases

P876

REFERENCE RANGES AND ASSOCIATED FACTOR FOR TRABECULAR BONE SCORE IN VIETNAM: VIETNAM OSTEOPOROSIS STUDY

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Background: As bone mineral density (BMD) measured by DXA can only assess changes in bone mass, while trabecular bone score (TBS) is a surrogate indicator of bone microarchitecture and can predict the risk of fractures independently of BMD. The normative values of trabecular bone score in the Vietnamese population is unknown.

Objective: To estimate the reference ranges and associated factor for TBS among community-dwelling individuals in Vietnam.

Method: This cross-sectional study is part of the Vietnam Osteoporosis Study. The study involved 2683 women and 1454 men aged 20 years and older, who were randomly sampled from various districts within Ho Chi Minh City, Vietnam. BMD at the femoral neck, lumbar spine was measured by DXA (Hologic QDR4500). Lumbar spine TBS was obtained by the iNsight software, version 2.1 (Medimaps, Merignac, France). Anthropometric and clinical data were collected using a structured questionnaire. Multivariable regression analysis was used to determine the association between potential factors and TBS.

Results: The mean TBS for the young adult group (ages 20 to 39 years) was determined to be 1.46 ± 0.08 (overall), 1.47 ± 0.07 for men and 1.46 ± 0.08 in women. In men, these cutpoints were equal to a TBS less than 1.295 for a determination of degraded microarchitecture, and between 1.295 and 1.400 for a determination of partially degraded microarchitecture. In women, these cutpoints were 1.260 and 1.380, respectively. The best-fit models for TBS included age, height and BMD.

Conclusion: This research provides reference values for assessing the risk of fractures in the elderly in Vietnam, helping to more accurately evaluate the risk of fractures for the community.

Keyword: Osteoporosis, Trabecular Bone Score

P877

RELATIONSHIP BETWEEN T-SCORE AND PRESENCE OF VERTEBRAL FRACTURES IN HOSPITALIZED PATIENTS WITH HIP FRAGILITY FRACTURE

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Objectives: To describe the relationship between the T-score and the presence of vertebral fractures in patients with hip fragility fracture treated by the Fracture Liaison Service (FLS) of the San José Hospital in Bogotá, Colombia.

Materials and methods: Descriptive cross-sectional study. 50 patients hospitalized for hip fracture were included. They underwent dorsal-lumbar spine radiography as screening for vertebral fractures and bone densitometry using radiofrequency echographic multi-spectrometry (REMS) technology. The correlation between T-score values in the lumbar spine (LS), femoral neck (FN) and total hip (TH) was described using Spearman's rho coefficient.
Results: Eighty percent of the participants were female. The mean age was 78.8 +/- 8.69 years. Diabetes, chronic kidney disease, and vertebral fracture documented by radiography were diagnosed in 20.4%, 18.4%, and 20.4% of the patients, respectively. In patients with vertebral fracture vs. those without, the T-score was comparatively lower in FN (-3.2 vs. -2.8), TH (-2.8 vs. -2.5), and LS (-3.4 vs. -3.1). The correlation between LS T-score and FN T-score was 0.7 ($p< 0.001$), and the correlation between TH T-score and FN T-score was 0.94 ($p< 0.001$).
Conclusions: Vertebral fracture in patients hospitalized for hip fracture appears to correlate with lower T-score values at the 3 anatomical reference sites compared to patients in whom vertebral fracture was not documented. This may influence the choice of treatment and preventive measures to minimize the risk of refracture.

P878

CONCORDANCE BETWEEN MULTI RADIOFREQUENCY ECHOGRAPHIC MULTI-SPECTROMETRY (REMS) AND DUAL X-RAY ABSORPTION FOR THE DIAGNOSIS OF OSTEOPOROSIS IN POSTMENOPAUSAL WOMEN: A REAL-WORLD STUDY

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Objectives: To evaluate the concordance between bone densitometry (BMD) by radiofrequency echographic multi spectrometry (REMS) and dual energy X-ray absorptiometry (DXA) for the diagnosis of osteoporosis in postmenopausal women treated in the endocrinology clinic of an hospital in Bogotá, Colombia.
Methods: Descriptive cross-sectional study. Fifty women with an indication for BMD who underwent the examination by DXA and REMS methods were included. Diagnostic concordance was assessed by the percentage of patients classified within the same category by both methods (normal, osteopenia and osteoporosis) and their corresponding concordance correlation coefficient.
Results: The mean age was 67 +/- 12.4 years. Analysis revealed that based on DXA, 56% of patients were diagnosed with osteoporosis, 38% with osteopenia, and 6% had normal BMD. When these results were compared with REMS, it was found that 92.9% of patients classified with osteoporosis by DXA were identified in the same way by REMS. However, only 36.8% of patients diagnosed with osteopenia by DXA were classified in the same category by REMS and of 19 patients with osteopenia by DXA, 11 had osteoporosis by REMS. The agreement between the methods, measured by the concordance correlation coefficient (CCC), was 0.53 (95% CI 0.32–0.68; $p<0.01$) in the lumbar spine and 0.38 (95% CI 0.13–0.58; $p<0.01$) in the femoral neck. A larger sample is required to optimize the correlation results
Conclusions: These findings suggest that REMS showed a high concordance with DXA in the identification of osteoporosis, especially in the lumbar spine, allowing therapeutic decisions to be made given the possibility of obtaining results at the patient's bedside without exposure to ionizing radiation. It is important to consider the variability in the concordance according to the anatomical region evaluated and the factors that may affect it.[1] This is the first study in Colombia to determine the diagnostic concordance between both techniques, so further studies are recommended to expand these results.

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P879

OSTEOPOROSIS DUE TO INACTIVITY IN A YOUNG MALE PATIENT WITH RUPTURED AORTIC ARCH ANEURYSM – POST-SURGICAL INTERVENTION

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The patient is a 50-year-old male with a medical history of right-sided hemiparesis following an ischemic stroke in the left middle cerebral artery (MCA) territory, secondary to cerebral infarction caused by thrombosis of the cerebral artery (October 22, 2020). The patient also has a ruptured aortic arch aneurysm with a giant hematoma, which displaces the trachea. He underwent surgical intervention with a Dacron 28 prosthesis replacement (December 9, 2020). Additional diagnoses include grade III hypertension and osteoporosis resulting from inactivity (April 2022). The patient is currently hospitalized for motor deficits affecting the right hemicorporeal side, difficulties with activities of daily living (ADLs), and motor aphasia.

Functional Assessment:

- **FIM (Functional Independence Measure) Score**: 50 out of 126 points (39.68%).
- **Barthel Index**: 30 out of 100 points – indicating severe dependency.
- **FAC (Functional Ambulation Classification)**: Level 1 – Ambulatory, requiring physical assistance (level 2).
- **Fall Risk**: 18 points on the Johns Hopkins Fall Risk Assessment Scale.

DXA (Dual-energy X-ray Absorptiometry) Results

DXA Data	Measurement Location	BMD (g/cm²)	Z-Score	10-Year Osteoporotic Fracture Risk	10-Year Hip Fracture Risk
2022	Right Hip	0,685	-2,4	4,74%	2,72%
	Left Hip	0,794	-1,8		
	Lumbar Spine	0,836	-1,5		
2024	Right Hip	0,631	-2,7	4,83%	2,7%
	Left Hip	0,786	-1,8		
	Lumbar Spine	0,727	-2,2		

Results There is a noticeable decline in BMD over the course of the disease. The motor deficit of the right hemibody corresponds with a more pronounced decrease in BMD at the right hip.
Conclusion Monitoring BMD progression in neurological patients is crucial for the prevention of osteoporotic fractures.

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MULTIPLE SCLEROSIS AND OSTEOPOROSIS: IMPLICATIONS FOR PATIENT CARE

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Several studies have reported that individuals with multiple sclerosis have lower bone mineral density and higher rates of osteoporosis compared to healthy people. We describe a 55-year-old female patient known with secondary progressive multiple sclerosis for 18 years, with relapses after 8, 9 and 10 years from onset manifested by decreased muscle strength in the lower limbs. She was admitted to the clinic with tetraparetic motor deficit, orthostatic and gait deficit, deficit in performing transfers, moderate deficit in performing ADLs, cervical and lumbar pain, sphincter dysfunctions of retentive type, being diagnosed with tetraparesis with predominance of spastic paraparesis, chronic vertebrogenic lumbosacralgia with radiculalgia. She also had severe osteoporosis, with DXA total hip T-score -3.8 and lumbar spine T-score -2.0. Clinical examination revealed impossible walking and standing, ambulation possible in a wheelchair propelled by another person, transfers from supine to sitting at the edge of the bed with 100% help from another person, marked bilateral hypotonia and hypotrophy of the anterior and posterior calf muscles. Maintenance of the posture while sitting was difficult with lateral deviations, she did not actively mobilize lower limbs, had absent motor control and Ashworth spasticity score was 3. Deep tendon reflexes were abolished in both lower limbs, coordination was impossible to assess. She actively mobilized upper limbs; motor control was present but presented upper limbs coordination disorder, more pronounced on the right. Ashworth spasticity score was 2. FIM and Barthel scores were 85/126 and 60/100, respectively. Modified fatigue impact scale revealed 40 points out of 84; Penn Spasm Frequency Score was 1/4 and ADL score 6/10. Complex medical rehabilitation focused on personalized physiotherapy, breathing exercises, global analytical mobilizations, occupational therapy, Frenkel program from sitting position, robotic therapy, Vibramoov proprioceptive modulation therapy, laser, Vojta therapy and medication led to a slowly favorable evolution, with improvement of symptoms and functionality. These findings highlight the importance of muscle and bone health assessment as part of the management of multiple sclerosis patients.

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BONE HEALTH IN PATIENTS WITH NON-METASTATIC PROSTATE CANCER ON ANDROGEN RECEPTORS INHIBITORS: A SYSTEMATIC REVIEW

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Background
Androgen deprivation therapy is commonly used in patients with prostate cancer, in combination with primary therapy, and has been associated with a deleterious impact on bone health. Although androgen receptors inhibitors (ARI) do not reduce androgen levels, recent data on second generation ARI suggests that these agents increase the risk of falls and fractures in patients with prostate cancer.
Objective
Our aim is to review the impact of ARI on bone turnover markers, bone mineral density and fractures in men with non-metastatic prostate cancer.
Material and methods
This is a systematic review of the literature. We included observational and interventional studies on patients with non-metastatic prostate cancer, receiving ARI, including apalutamide, darolutamide, enzalutamide or abiraterone, alone or in combination with another androgen deprivation therapy. Eligible studies reported on one or more skeletal parameters, including bone turnover markers, bone mineral density and fracture. We searched Medline and Embase from database inception until January 2025. We used MeSh terms and keywords relevant to prostate cancer, ARI and bone markers, density and fracture. We screened titles and abstracts and full text articles in duplicate and independently, and after a calibration exercise. We abstracted data on the population, intervention and outcomes of interest. We evaluated the risk of bias using the New Castle Ottawa quality assessment scale for observational studies and the Cochrane risk of bias assessment tool 2019 for interventional studies.
Results
Our search strategy yielded 839 citations. (We are in the process of finalizing the results that will be available by April 2025)
Conclusion
Given the significant role of ARI in the prognosis of patients with non-metastatic prostate cancer, it becomes crucial to investigate their potential deleterious effect on bone health. Our findings are expected to impact the approach to patients with non-metastatic prostate cancer on ARI, to preserve their bone health, as it is the

case with other modalities of androgen deprivation therapy.

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DESTRESSING MINDS. STRENGTHENING MUSCLES. YOGA AND ITS EFFECT ON MUSCLE STRENGTH IN HEALTHY INDIVIDUALS. A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Background Muscle strength is crucially associated with BMD and falls risk. Yoga, an ancient practice that in general combines poses (asanas) and breathing exercises (pranayama), involves seated, standing, as well as supine postures that target most major muscle groups. Though its effects on balance, BMD and falls risk have been evaluated recently(1), studies exploring yoga's effects on muscle strength have not been systematically reviewed before. We evaluated randomized controlled trials (RCTs) comparing yoga's effects on hand grip strength (HGS) and lower limb strength (LLS) against no intervention controls (NIC) and active interventions (AC) such as Pilates, core stabilization exercises, and Taichi in healthy individuals.

Methods We systematically searched scientific databases following a predefined protocol. Heterogenous data were qualitatively summarized. We conducted a meta-analysis of studies comparing yoga to NIC and AC, using standardized mean differences (SMDs) to pool outcomes.

Results Twenty-five RCTs involving 1817 participants aged 6–90 years were analyzed. Yoga styles included Hatha, Ashtanga, Iyengar, Bikram etc. Yoga significantly improved HGS compared to NIC [SMD 0.50 (95% CI: 0.04–0.97); P=0.03; I²=77%]. A single study that compared yoga to AC reported positive HGS effects, with no between-group differences. Yoga also significantly enhanced LLS compared to NIC [SMD 1.51 (95% CI: 0.86–2.15); P<0.00001; I²=84%] and AC [SMD 0.44 (95% CI: 0.14–0.74); P=0.004; I²=8%]. Intervention lengths, and assessment methods showed significant heterogeneity.

Conclusion Yoga significantly enhances HGS and LLS in healthy individuals compared to controls, with modest improvement in LLS and comparable benefits in HGS to AC. Future research should standardize protocols to better explore optimal yoga practices for muscle strengthening and their mechanisms.

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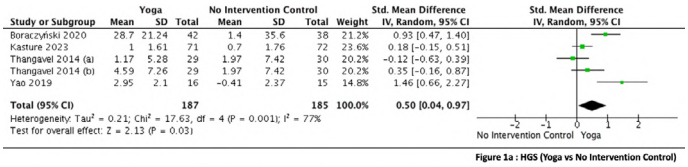

Figure 1a : HGS (Yoga vs No Intervention Control)

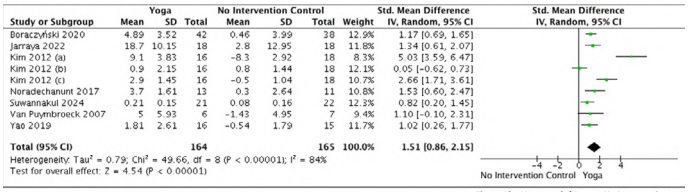

Figure 1b : LL strength (Yoga vs No Intervention Control)

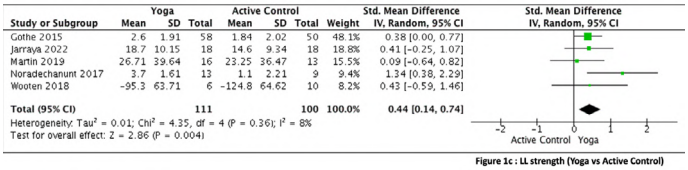

Figure 1c : LL strength (Yoga vs Active Control)

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CLINICAL ADOPTION OF AI-DRIVEN OPPORTUNISTIC BONE HEALTH SCREENING IN CANADA

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Objective: To report on measures of clinical adoption of a regulatory-approved medical device that analyzes x-rays of the chest, lumbar spine, thoracic spine, pelvis, knee or hand/wrist, acquired for any indication, and alerts the radiologist at the time of x-ray reporting if the patient is likely to have low BMD (DXA T-Score < -1 at the femoral neck or lumbar spine).

Materials and Methods: For nine imaging organisations, we quantified x-ray accessions screened and those identified as at-risk for low BMD. At two organisations, we quantified the rate of radiologists including the finding in their x-ray reports, and whether reporting the finding led to a subsequent DXA. True positive rate of low BMD and elevated fracture risk were calculated when available.

Results: The device has prospectively screened 250,000 unique patients in Canada during routine clinical care. At each of the 9 imaging organizations, the sex- and age-group-specific rates of *device-flagged* low BMD were consistent with published rates of low BMD (by DXA) in the general population. At one academic centre, the mean rate of radiologists including the finding in their x-ray reports was 80%; at a community-based centre, the mean rate was 52% and ranged from 0-89%. Half of DXAs ordered in response to a reported finding were a patient's first-ever. 54% of patients who returned for DXA had elevated fracture risk. In men ≥65 years, first-ever DXAs triggered by the device (vs. not) identified significantly more patients with osteoporosis and elevated fracture risk. Of 51 family physicians who completed a survey, 78%

believe that the opportunistic screen is beneficial for patient care. Of 389 patients who completed a survey, 36% of flagged patients discussed bone health with their physician within six months of their x-ray, and 10-25% were newly diagnosed with osteoporosis.
Conclusion: Adoption of an opportunistic screen identifies patients who would benefit from clinical fracture risk assessments. In Canada, the device is facilitating appropriate follow-up care of patients at-risk of osteoporotic fractures. By including the results in their x-ray reports, radiologists can help address the care gap in osteoporosis, by providing a "smart nudge" to referring physicians to conduct the often-overlooked clinical fracture risk assessment.
Disclosures: MC, AB and CS report a relationship with 16 Bit Inc that includes employment and/or equity or stocks.

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ASSESSMENT OF 10-YEAR RISK OF FRACTURE WITH BMD ADJUSTMENT (FRAXPLUS) IN MENOPAUSAL WOMEN WITH BILATERAL ADRENAL NON-FUNCTIONING TUMORS: A PILOT STUDY

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Background: Accidentally detected bilateral adrenal tumors might display a mild autonomous cortisol secretion with a potential higher fracture risk, especially, in menopausal women. No specific algorithm is yet to integrate the osteoporosis profile in these patients.
Objective. This was a pilot study aimed to assess the 10-year fracture risk via traditional FRAX tool and FRAXplus with bone mineral density (BMD) adjustment. (https://www.fraxplus.org/)
Methods: Menopausal women diagnosed with non-functioning bilateral adrenal tumors (AT) underwent central DXA scan (GE Lunar Prodigy). Exclusion criteria: prior diagnosis of osteoporosis and previous exposure to anti-osteoporotic drugs. FRAX and FRAXplus provided 10-year major osteoporotic fracture risk (MOF) and hip fracture (HF), respectively, MOF1, and HF1.
Results: The studied population (N=26) included group AT (N=13) and 13 age-matched non-AT controls (group C) with a mean age of 53.46±6.41, respectively, 57.00±2.48 years, and years since menopause of 7.23±6.21, respectively, 10.08±3.55 ($p<0.5$). Lumbar BMD was similar between AT and C group, as well as femoral neck and total hip BMD. MOF had a median of 2.35 with interquartile interval (IQR) between 1.40 and 3.60% in group AT versus 2.70(2.30, 3.02)% in group C, and HF was 0.30(0.10, 0.90)% versus 0.20(0.14, 0.42)% ($p<0.5$ for each). MOF1 was 2.05(1.40, 2.60)% versus 2.25(2.20, 2.95)%, and HF1 of 0.25(0.10, 0.70% versus 0.25(0.10, 0.30)% ($p<0.5$ for each). MOF1 in group AT was statistically significant higher than in group C ($p=0.014$).
Conclusion. FRAXplus might prove a good discriminator in menopausal women with apparently non-secreting bilateral adrenal tumors in order to pinpoint the osteoporotic fracture risk.

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10-YEAR RISK OF FRACTURE ASSESSMENT WITH BMD ADJUSTMENT (FRAX PLUS) IN TERIPARATIDE CANDIDATES: A PILOT STUDY AMID 24-MONTH PROTOCOL FOR SEVERE MENOPAUSAL OSTEOPOROSIS

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Background: Severe osteoporosis poses supplementary risks of further fractures and fracture risk is essentially needed to capture the essence of this complicated picture
Objective: We aimed to assess the 10-year fracture risk of major osteoporotic fractures (MOF) and hip fracture (HF) via using traditional FRAX tool and FRAX plus that provided MOF and HF by using lumbar bone mineral density (BMD) in teriparatide (TPT) candidates.
Methods: Menopausal women with severe primary osteoporosis underwent 24-month TPT protocol (20 µg/day, subcutaneous) under annual DXA (Dual-Energy X-Ray Absorptiometry) control.
Results: 32 TPT candidates with mean age of 66.69±8.47years and year since menopause of 21.53±10.17 were evaluated at TPT initiation and after 24 months. Lumbar, femoral neck, and total hip BMD, as well as T-score were statistically significant higher after 2 years of TPT ($p<0.05$). MOF at baseline was 9.85±3.54%, respectively, HF was 3.67±2.40, similar at the end of protocol, of 9.70±3.73% and 3.58±2.36%, respectively ($p>0.5$ for each). MOF adjusted for lumbar BMD at baseline (6.66±2.29%) was similar after 2 years (6.56±2.28%) as well as HF adjusted for lumbar BMD (2.36±1.56% versus 2.30±1.52%, $p<0.5$). Comparing MOF via FRAX versus FRAXplus, respectively, HF, both were statistically significant lower according to FRAXplus at baseline and after 2 years ($p<0.001$ for each).
Conclusion: Using lumbar BMD for MOF and HF, the 10-year risk was lower than using traditional FRAX in high-risk patients with complicated osteoporosis. BMD improvement under medication was not captured by any of the 10-year risk assessment.

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Acknowledgements: This is part of the PhD research entitled "Imaging aspects of cervico-mediastinal and pulmonary endocrine masses with addressability in thoracic surgery"

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PRIMARY HYPERPARATHYROIDISM DUE TO MULTIGLANDULAR DISEASE AND ADRENAL TUMORS-RELATED MILD AUTONOMOUS CORTISOL SECRETION: IMPACT ON OSTEOPOROTIC FRACTURE RISK AND TAILORED DECISION THERAPY

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Background/Objective: The wide spectrum of primary hyperparathyroidism (PHPT) includes, among others, multi-glandular parathyroid disease. When associated with different endocrine tumors such as pituitary adenomas and adrenal tumours (AT), genetic profile should be taken into consideration. We aim to introduce a female with severe osteoporosis in the setting of PHPT associated with MACS (mild autonomous cortisol secretion)-positive AT. **Method:** This was a case report. **Results:** A 75-year-old female with osteoporosis diagnosed at 59 (menopause at 43) was treated with bisphosphonates for 16 years (alendronate-9 years, 1-year-drug holiday, alendronate-1 year risedronate-5 years). After first 9 years of alendronate, DXA showed lowest T-score at femoral neck: BMD=0.614g/cm^2,T=-2.1,Z=-0.4 and she had multiple vertebral fractures. She was confirmed with PHPT at 49[total serum calcium were between 10.4-11.7mg/dL(normal:8.4-10.2) and PTH between 65-77.4 pg/mL(normal:15-65)] associated with bilateral AT, non-secreting pituitary adenoma, type 2 diabetes, hypertension and psoriasis. After 16 years of bisphosphonates, BMD improved in association with conserving a partially degraded TBS (of 1.284). In the meantime, neck ultrasound showed upper bilateral parathyroid tumours of maximum 1.7 cm, but they were not confirmed at CT scan or MIBI Tc99m scintigraphy, and the patient postponed surgery. CT also confirmed bilateral ATs of maximum 2.7cm that involved a MACS confirmation [plasma cortisol after 1 mg dexamethasone overnight of 5.14µg/dL (normal<1.8)]. Due to long-standing presence of both types of endocrine tumours and declined surgery, she continued with risedronate.**Conclusion**: This case highlights multifactorial pathogeny of osteoporosis in patients with endocrine tumours.

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IDENTIFICATION OF AN INTRATHYROIDAL PARATHYROID ADENOMA-RELATED PRIMARY HYPERPARATHYROIDISM AFTER 4-YEAR HISTORY OF SEVERE OSTEOPOROSIS

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Background/Objective: Both osteoporosis and primary hyperparathyroidism (PHPT) are conditions that predominantly affect postmenopausal women. In patients with PHPT, osteoporosis is one of the surgical indications both due to disease burden and considering the positive impact of parathyroidectomy on bone health. The improvement of bone status has been observed even in patients with osteopenia. We aim to introduce such a case.
Method: This was a case report.
Results: A 65-year-old female with metabolic syndrome and a 4-year history of severe osteoporosis (complicated with a low-trauma tibia fracture) was treated with oral bisphosphonates

until PHPT-related symptomatic hypercalcemia was identified. On admission, PHPT was confirmed: total calcium=13.2mg/dL (normal:8.4-10.2), PTH=489.3pg/mL (normal:15-65) associated with vitamin D deficiency based on 25-hydroxyvitaminD of 17.2ng/mL (normal>30). Increased resorption and formation according to the bone turnover markers was found: CrossLaps=1.03ng/mL (0.33-0.782) - resorption, respectively, formation - osteocalcin=101.4ng/mL (normal:15-46), P1NP=87.09ng/mL (normal:20.25-58.59), and alkaline phosphatase=154 U/L (normal:38-105). DXA showed: lumbar BMD=0.953g/cm^2, T-score=-1.9, Z-score=-0.4, total hip BMD=0.656g/cm^2, T-score=-2.8, Z-score=-1.8, femoral neck BMD=0.701g/cm^2, T-score=-2.4, Z-score=-0.9. She was switched to zoledronate 5mg/year to control hypercalcemia and act against bone loss. Cervical ultrasound showed a parathyroid tumour of 2.8 cm with SPECT/CT confirmation. The patient then underwent parathyroidectomy. (Intra-thyroid parathyroid adenoma with chief and oxyphil cells was confirmed). Post-operative panel was normal (total serum calcium=9.9 mg/dL). Further annual injection was continued in addition to 2000U/day cholecalciferol. **Conclusion**: Underlying overlapping endocrine causes of severe osteoporosis such as PHPT might be identified long-term after the anti-osteoporotic drug initiation.

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FORESTALLING SEVERE OSTEOPOROSIS IN A MALE CONFIRMED WITH PRIMARY HYPERPARATHYROIDISM ASSOCIATED WITH AND HYPERTHYROIDISM

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Background/Objective: Hip fracture is associated with higher mortality in men despite a lower incidence compared to women. Osteoporotic fractures in men may be associated like primary hyperparathyroidism (PHPT) and hyperthyroidism. We aim to introduce such a case. **Method**: case presentation. **Results:** A 60-year-old male with a recent history of symptomatic hypercalcemia due to PHPT [total calcium=15.04mg/dL (normal:8.6-10.3), PTH=627pg/mL (normal:12-88)] treated with ibandronate 3 mg intravenously has mitral valvuloplasty, and aortic regurgitation. He was also confirmed with hyperthyroidism and treated with daily methimazole for 3 years. In the meantime, he suffered a fragility fracture at the right hip. Currently, hypercalcemia is controlled (total calcium=9.8mg/dL) with increased bone resorption [CrossLaps=0.54ng/mL (normal:0.101-0.504)], but normal bone formation markers [osteocalcin=43.52ng/mL (normal:14-46), P1NP=51.92ng/mL (normal:20.25-76.31), alkaline phosphatase=102U/L (normal:38-129)] amid mild vitamin D deficiency [25-hydroxyvitaminD=13.4ng/mL(normal>30)]. DXA confirmed osteoporosis: lumbar BMD=0.938g/cm^2, T-score=-2.3, Z-score=-2.5, total hip BMD=0.750g/cm^2,T-score=-2.6, Z-score=-2.3, femoral neck BMD=0.776g/cm^2, T-score=-2.3, Z-score=-1.7, third distal radius BMD=0.420g/cm^2,T-score=-2,Z-score=1.6SD, and partially degraded microarchitecture(TBS=1.303).Thyroid function normalized under treatment. Cervical ultrasound revealed a right inferior parathyroid tumour of 30x22x22 mm. The patient underwent synchronous right inferior parathyroidectomy and thyroidectomy with low-normal post-surgery calcemic values[total calcium=8.7mg/dL], Further annual zoledronate 5 mg was continued. **Conclusion**: Osteoporotic fractures may occur even in the early stages of PHPT. Long-standing undertreated hyperthyroidism adds to the fracture risk even in males. Therefore, PHPT diagnosis and treatment should not be overlooked in men with hip fractures, as the disease may progress to other fractures and life-threatening hypercalcemia, hence, increasing disease burden, and impaired quality of life.

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BILATERAL ADRENAL TUMORS, PRIMARY HYPERPARATHYROIDISM, AND RHEUMATOID ARTHRITIS: BONE STATUS AMID PATIENT'S OPTION OF SURGERY

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Objective: Mild autonomous cortisol secretion (MACS), primary hyperparathyroidism (PHPT), rheumatoid arthritis (RA), and type 2 diabetes (DM2) are fracture risk factors. We aim to introduce such a case.
Methods: case report.
Results: This is a 64-year-old patient with a 3-year history of bilateral nonfunctional adrenal adenomas (NFAI), RA, DM2, osteopenia, and multinodular goiter-related hypothyroidism since the age of 56 (controlled under levothyroxine), and hypertension. Since the age of 61, persistent mild hypercalcemia with high PTH was found[PTH=99.41pg/mL(normal:17.3-74.1)]; a upper right parathyroid tumour was detected by ultrasound. Bone turnover markers were normal[(formation) osteocalcin=16.42ng/mL(normal:15-46), alkaline phosphatase=79.5U/L(normal:35-104), P1NP=47.97ng/mL(normal:20.25-76.31), and (resorption) =CrossLaps=0.4ng/mL(normal:0.33 0.782)]. Currently, DXA showed stationary scores, the lowest T-score at lumbar spine [BMD=0.908g/cm^2,T-score=-2.1,Z-score=-1.4]. MACS was not confirmed [ACTH=13.79pg/mL(normal:7.2-63.3) plus second-day morning plasma after dexamethasone 1mg suppression test of 1.15µg/dL(normal<1.8)]. Computed tomography showed stationary bilateral nodular adrenocortical disease (largest diameter of 2.1 cm). The surgery for the parathyroid was postponed by the patient (indicated due to calcium levels). Zoledronate 5 mg/year was administered in addition to daily 2000U cholecalciferol.
Conclusion: In patients with NFAI, especially bilateral, a follow-up is mandatory due to potential bone and cardio-metabolic implications. Lack of surgery in PHPT might add to the overall picture. However, in this case, osteopenia was correlated with multiple factors like PHPT, rheumatoid arthritis, DM2, but the patient' decision was not to undergo surgery. Despite osteopenia at DXA, the anti-osteoporotic pharmacologic intervention should be considered due to the complex multidisciplinary panel of co-morbidities that might affect the skeleton health.

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P890

BONE HEALTH ASSESSMENT IN SYSTEMIC LUPUS ERYTHEMATOSUS COMPLICATED BY AUTOIMMUNE HEPATIC CIRRHOSIS: OSTEOPENIA, DECREASED TBS, HYPOCALCEMIA AND VITAMIN D DEFICIENCY

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Background: Osteoporosis is a common finding in patients with collagen disorders, particularly, those with systemic lupus erythematosus (SLE). The etiology is multifactorial, including glucocorticoids and other immunosuppressive drugs.
Objective: We aim to introduce such case.
Methods: case report.
Results: A 61-year-old woman known with a 3-year history of SLE, autoimmune cirrhosis and antiphospholipid syndrome, with long term glucocorticoid therapy (prednisone 10 mg/day) was admitted for itchy and erythematous rashes on her right calf, gingival bleeding, and fatigue. Clinical examination showed eczema on her right leg in addition to active cirrhosis. Blood tests revealed leukopenia of 3.02k/µL (Normal:4.10-10.9), thrombocytopenia of 49k/µL (Normal:140-440), low complement fractions: C3=33.3mg/dL (Normal:90-180) and C4=1.8mg/dL (Normal:10-40) associated with hypocalcemia 8.65mg/dL (Normal:8.80-10.6), hypovitaminosis D=15.5ng/mL (Normal:20-160), and hypomagnesemia=1.74mg/dL (Normal:1.90-2.5). Moreover, polyclonal hypergammaglobulinemia was confirmed: high IgA=1041mg/dL (Normal:70-400) and IgG=2631mg/dL (Normal:700-1600); positive autoimmune profile in terms of antinuclear antibodies R=9.5 (Normal:negative), anti-Ro(SS-A)=65.3U/mL (Normal<15), anti-La(SS-B)=30U/mL (Normal<15), and anti-Smith antibod-

ies>200U/mL (Normal<15). SLE-Disease-Activity-Index score of 4 points was better than initial score of 14. Thyroid evaluation was normal in terms of function. Abdominal ultrasound confirmed a cirrhotic liver, with no ascites. Central Dual-Energy X-Ray Absorptiometry (DXA) showed osteopenia: femoral neck BMD of 0.799 g/cm^2, T-score -1.5, Z-score 0.4, total BMD hip of 0.850 g/cm^2, T-score -1.3, Z-score -0.4, lumbar BMD of 0.913 g/cm^2, T-score -2.3, Z-score -1.2 and decreased trabecular bone score (TBS) of 1.101. A reduction in glucocorticoid dose (prednisone 5 mg/day) was recommended in addition to calcium and vitamin D supplementation and specific diet recommendations for the liver condition.

Conclusion: This case emphasizes multiple elements of bone health impairment in rheumatologic patients diagnosed with autoimmune conditions complicated with autoimmune liver ailments in addition to the glucocorticoid-induced bone loss. It is crucial to early detect and treat osteoporosis in lupus patients, especially those on long-term glucocorticoid therapy, in order to reduce the fracture risk and conserve the quality of life.

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BONE FRAGILITY AMID THE DIAGNOSIS OF GRAVES' DISEASE, BREAST CANCER WITH EARLY HYPOGONADISM, AND BILATERAL SPORADIC NODULAR ADRENOCORTICAL DISEASE

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Background/Objective: Increased thyroid hormone levels may adversely affect the bone metabolism and mass, additionally to the menopause- or age-related effects and incidental endocrine tumours. We aim to introduce such a case. **Method:** case report. **Results:** A 56-year-old female has a 4-year history of TRAb-positive Graves' disease continuously treated with thiamazole. At age of 42, she was confirmed with mammary cancer (treated with surgery plus adjuvant radiotherapy, chemotherapy associated with surgical menopause and 5-year exposure to tamoxifen). She associates hypertension, bilateral sporadic nodular adrenocortical disease (largest tumour diameter of 2.2 cm) since the age of 43. Osteoporosis was confirmed 4 years ago at DXA [lumbar BMD=0.821g/cm^2, T-score=-3, Z-score=-2.3, femoral neck BMD=0.780g/cm^2, T-score=-1.9, Z-score=-0.9]. Zoledronate 5 mg per year was initiated (in addition to 2000 UI/day cholecalciferol) followed by i.v. ibandronate every 3 months. Currently, thyroid function normalized under low-dose of thiamazole. DXA improved [lumbar BMD=0.968g/cm^2, T-score=-1.8, Z-score=-1, femoral neck BMD=0.853g/cm^2, T-score=-1.1, Z-score=0.2] with suppressed bone turnover markers [osteocalcin=9.71ng/mL (normal:15-46), alkaline phosphatase=72U/L (normal:38-105), P1NP=19.35ng/mL (normal:20.25-76.31), and CrossLaps=0.18ng/mL (normal:0.3-0.782)]. Unsuppressed 2nd day-plasma-cortisol post-dexamethasone (1 mg) test confirmed non-functional adrenal profile [of 1.26µg/dL (normal<1.8)]. She continued with 3 mg ibandronate every 3 months in addition to 2000 UI/day cholecalciferol and 5mg/day thiamazol. **Conclusion**: Long-term history of hyperthyroidism, treatment for breast cancer, including surgically-induced primary hypogonadism, and adrenocortical disease represents a multi-factorial contribution to low BMD.

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BONE HEALTH IMPROVEMENT FOLLOWING PARATHYROIDECTOMY IN A PATIENT WITH SYMPTOMATIC PRIMARY HYPERPARATHYROIDISM FOLLOWED BY ITS DETERIORATION AMID DEVELOPMENT OF END-STAGE KIDNEY DISEASE

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Background: Primary hyperparathyroidism (PHPT) causes bone loss both directly and indirectly through comorbidities such as chronic kidney disease (CKD). Parathyroidectomy promotes bone mass gain. However, CKD may reduce this effect, as it is associated with a reduction in bone quality and quantity. While low turnover characterizes the early stages, more advanced stages are associated with high turnover.

Objective: We aim to analyse bone status in a patient with PHPT and CKD.
Method: This is a case report.
Results: A 63-year-old male with a history of total thyroidectomy for goitre was diagnosed with PHPT and had undergone surgery for urolithiasis. At diagnosis: total serum calcium=13.2mg/dL (normal:8.4-10.2), ionized calcium=5.7mg/dL (normal:3.9-4.9), phosphorus=2.5mg/dL (normal:2.7-4.5), PTH=288.2pg/mL (normal:15-65), 25-hydroxyvitamin D=19.1ng/mL (normal>30), and eGFR=55mL/min/1.73m^2. Bone turnover markers (BTM) showed increased resorption: CrossLaps=0.68ng/mL (normal:0.1-0.5), and normal formation: alkaline phosphatase=68U/L (normal:38-129), osteocalcin=45.8ng/mL (normal:14-46). DXA revealed osteoporosis: lowest score at third distal radius BMD=0.581 g/cm^2, T-score=-2.8, Z-score=-2.3. He continued with twice yearly denosumab and underwent right parathyroidectomy. One year post-surgery, calcium and PTH were still normal; BTM showed reduced formation with stationary DXA and low TBS of 1.281. Two years post-parathyroidectomy, end-stage kidney disease stage was confirmed. Additionally, he was offered alfacalcidol 0.5mg/day. One more year later, high-normal calcaemic level and normal PTH were associated with stationary DXA results.
Conclusion: While parathyroidectomy improves bone status in PHPT, the development of CKD (as a potential consequence of prior hypercalcemia) aggravates it. Denosumab might represent a valuable option against osteoporosis in this particular instance.
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BEYOND BACK PAIN: MILD AUTONOMOUS CORTISOL SECRETION COMPLICATED WITH VERTEBRAL FRACTURES

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Objective: The panel of osteoporotic fracture risks mild include the confirmation of mild autonomous cortisol secretion (MACS) in adrenal tumours (AT) or long-standing untreated thyrotoxicosis. We aim to introduce a subject with chronic back pain who was confirmed with MACS-AT. **Methods**: case report. **Results:** This is a 72-year-old female (menopause since the age of 46) was admitted for thyrotoxicosis [TSH=0.0045µUI/mL (normal:0.35-4.94) with positive TRAb=2.93UI/L (normal<1.75)], presenting palpitations, non-specific bone and muscle pain. She had chronic back pain which intensified a few months ago, leading to her admission to neurosurgery for L1 vertebroplasty. Other than mildly increased alkaline phosphatase=287 (normal:35-104)UI/L, and P1NP=77.02ng/mL (normal:20.25-76.31), the mineral metabolism assays were normal. DXArevealed osteoporosis: lumbar L3-L4 BMD=0.019g/cm^2, T-score=-9.5, Z-score=-7.8, total hip BMD=0.612g/cm^2, T-score=-3.2, Z-score=-1.8, femoral neck BMD=0.518g/cm^2, T-score=-3.9, Z-score=-2.2 and low TBS=1.191. Liver cholestasis was also confirmed: elevated total bilirubin=1.53 (normal:0.2-1.2), gamma-glutamyl transferase=483U/L (normal:9-64). After normalization of the thyroid function under thiamazol, a CT scan showed two left ATs with maximum diameter of 1.31 cm, respectively, and 3.04 cm. Baseline morning ACTH=7.92pg/mL(normal:3-66) and unsuppressed 2nd day plasma cortisol after 1 mg dexamethasone test=3.3µg/dL (normal<1.8) revealed MACS-AT. Zolendronate 5 mg/year was administered and vitamin D supplementation and mandatory endocrine follow-up was required.
Conclusion: In menopausal individuals with severe osteoporosis, overlapping ailments such as MACS-AT are prone to enhance the fracture risk. Under these specific circumstances, whether the adrenalectomy should be a mandatory step (especially, if complicated vertebral fractures are found) is still an open issue.
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CONUNDRUM OF BISPHOSPHONATES DRUG HOLIDAY DECISION AMID MENOPAUSAL OSTEOPOROSIS AND BILATERAL ADRENAL TUMORS PRESENTING MILD AUTONOMOUS CORTISOL SECRETION

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Background/Objective: A tailored decision regarding the pharmacological intervention to address the reducing of the osteoporotic fracture risk in bilateral adrenal tumors (BAT) complicated with mild autonomous cortisol secretion (MACS) is mandatory since the clear effects of full-blown Cushing syndrome are not present. We aim to introduce the conundrum of such case. **Method**: case report. **Results:** A 71-year-old female has a 9-year history of BATs (largest diameter of 2.2 cm). 16 years prior she was diagnosed with menopausal osteoporosis and then treated for 6 years with alendronate until the lowest T-score at DXA improved from – 2.5 to -0.9 in lumbar spine. She remained in drug holiday for a decade. Currently, she associates metabolic elements such as hypertension, dyslipidemia, obesity (body mass index=31.08kg/m²), and prediabetes[A1 glycated hemoglobin=6.08%(normal:4.8-5.9)]. The mineral metabolism assessments were normal, including hormones [25-hydroxyvitaminD=28.3ng/mL(normal>30),PTH=52.77pg/mL(normal:15-65)] and bone turnover markers [osteocalcin=26.87ng/mL(normal:15-46), CrossLaps=0.53ng/mL(normal:0.33 0.782)]. MACS confirmation remained unchanged [baseline ACTH=11.23pg/mL(normal:3-66) and unsuppressed 2nd day-plasma-cortisol after 1 mg dexamethasone testing=1.96µg/dL(normal<1.8)]. No prevalent of incidental fractures (at screening thoracic-lumbar spine X-Ray) were found. A mild BMD reduction was found: lumbar BMD=1.069g/cm²,T-score=-0.9,Z-score=0.6; femoral neck BMD=0.828g/cm²,T-score=-1.3,Z-score=0.3, and partially degraded microarchitecture (TBS=1.341). A decision of re-starting medication against osteoporosis was done and intravenous ibandronate (3 mg every 3 months) was initiated in addition to vitamin D 2000 UI/day. **Conclusion**: The impact of MACS on bone health and metabolic conditions may be considerable; yet the strategies referring to the decision of bisphosphonates drug holiday under these specific circumstances are still debatable.

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BONE STATUS IN A MALE PATIENT WITH CLEAR CELL RENAL CANCER-RELATED HYPERCALCEMIA OF MALIGNANCY AND END-STAGE KIDNEY DISEASE

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Background: Hypercalcemia of malignancy (HCM) is a common complication of various malignancies, including renal carcinoma (RC), and may be caused by parathyroid hormone-related protein (PTH-rp), bone metastases or ectopic calcitriol production. **Objective**: We aim to introduce such a case in a male patient with RC-related HCM. **Method**: This was a case report. **Results:** A 66-year-old male had a history of HCM in the setting of clear cell RC. At diagnosis, he had normal renal function, hypercalcemia [serum total calcium=16.9mg/dL (normal:8.8-10.2), ionized calcium=7.47mg/dL (normal:3.82-4.82)] and hypophosphatemia [phosphorus=2.4 mg/dL (normal:2.5-4.5)], hypervitaminosis D [1,25-dihydroxyvitamin D=96pg/mL (normal:19.9-79.3), 25-hydroxyvitaminD=17.6ng/mL (normal:30-55.5)], and suppressed PTH<1.2pg/mL (normal:15-65), and increased bone turnover markers (BTM) [CrossLaps=1.48ng/mL (normal<0.704), osteocalcin=47.6ng/mL (normal:14-46), alkaline phosphatase=145 U/L (normal:40-129)]. After fluid therapy and denosumab s.c., hypercalcemia improved to 13 mg/dL. The patient underwent left total nephrectomy and adrenalectomy. Postoperatively, cal-

cium decreased to 10.4mg/dL with normal PTH-rp<0.5 pmol/L (normal<1.3) and PTH=26.58 pg/mL. BTM were normal: Cross-Laps=0.15 ng/mL (normal: 0.104-0.504), osteocalcin=24.83ng/mL (normal:14-46), alkaline phosphatase=76U/L (normal:38-129). DXA revealed osteoporosis: lowest T-score of -3 at femoral neck BMD (g/sqcm) of 0.684, Z-score of -1.6. Bone scintigraphy excluded metastases. 2 years following surgery, total calcium level remained high-normal, while 3 years later; he had end-stage kidney disease G3a and supressed BTM with stationary DXA and reduced TBS results and normal adrenal function. Treatment with 0.25 mg of alfacalcidol was continued.

Conclusion: Renal cell carcinoma may impair bone quantity and quality both by HCM and chronic kidney disease.

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VERTEBRAL FRACTURE IN A PATIENT WITH BREAST CANCER, EARLY MENOPAUSE, AND ADRENAL TUMOR

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Objective: Early menopause might overlap with the presence of an adrenal tumour and breast cancer as multiple contributors to bone loss and increased osteoporotic fracture risk. We aim to introduce such case. **Method:** case report. **Results**: This is a 64-year-old female admitted for the evaluation of a left adrenal tumor of 1.48 cm that was discovered 2 years prior amid a computed tomography scan control following surgery for breast cancer (additionally, she received neoadjuvant chemotherapy, radiation therapy, and tamoxifen). She had surgical menopause since the age of 42 for a benign condition. She was also detected at that point with a L1 vertebral fracture whereas DXA showed: lumbar BMD=1.032g/cm^2, T-score= -1.1, Z-score= -0.8, femoral neck BMD=0.650g/cm^2, T-score= -2.8, Z-score= -2.2. Hence, she was offered ibandronate 3 mg/3 months until present time. She associates hypertension, dyslipidemia, obesity, non-secreting pituitary micro-adenomas, and goiter and normal thyroid function. Currently, after no incidental fracture, BMD improved: lumbar BMD=1.039g/cm^2,T-score= -1.1, Z-score= -0.4, femoral neck BMD=0.684g/cm^2, T-score= -2.5, Z-score= -1.8. The confirmation of a non-secreting adrenal profile was re-done [baseline ACTH of 24.9 pg/mL (normal:3-66); plasma morning cortisol of 18 µg/dL (normal:4.82-19.5), respectively, post-1 mg dexamethasone test of 1.1 µg/dL (normal:<1.8)]. She continued zoledronate 5 mg/year and vitamin D supplementation. **Conclusion**: The concurrent diagnosis of a vertebral fracture with an adrenal tumour, metabolic issues, and multimodal management for mammary cancer makes more difficult the overall strategy, but prompt intervention against osteoporosis reduces the overall burden.

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MULTIPLE CONTRIBUTORS TO SEVERE OSTEOPOROSIS IN A FEMALE DIAGNOSED WITH BILATERAL ADRENAL TUMORS, SYSTEMIC LUPUS ERYTHEMATOSUS AND SCLERODERMA

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Objective: Systemic lupus erythematosus, scleroderma and menopausal status are important contributors to the bone loss. We aim to present such patient. **Method**: case report. **Results**: This is a 63-year-old woman admitted for reassessment of bone status in the setting of a right humerus fracture despite treatment with a bisphosphonate. Her medical history includes menopause at 48 and osteoporosis since the age of 61, bilateral nonfunctional adrenal adenomas (right-1.3cm and left-1.1cm) since 9 years ago, systemic lupus erythematosus, scleroderma, and breast adenomas. The first DXA (Dual-Energy X-Ray Absorptiometry) evaluation was done 3 years ago, showing osteopenia [L1-4 BMD (bone mineral density)=1.057g/cm2, T-score=0.1SD, Z-score=1.5SD; femoral neck BMD=0.633g/cm^2, T-score=-2SD, Z-score=-0.7SD]. She startedrisedronate (35mg/week) until present time. Currently, the biochemistry and hormonal panel of calcium-phosphorus metabolism was normal [including total serum calcium, serum phosphorus, 25-hyroxyvitamin D, and parathormone], as well as bone turnover markers [of formation: osteocalcin=16.86ng/mL(normal:15-46), alkaline phosphatase=73.4UI/L(normal:35-104), and P1NP=63.61ng/mL(normal:20.25-76.31), and of resorption: CrossLaps=0.35ng/mL(normal:0.33-0.782)]. DXA-BMD decreased [L1-L4 BMD=1.010g/cm^2, T-score=-1SD, Z-score=-0.2SD; femoral neck BMD=0.690g/cm^2, T-score=-2.5SD, Z-score=-1.6SD] with trabecular bone score of 1.225 cofirming partially degraded microarchitecture. Bilateral adrenal adenomas were stationary at imaging scans, also, showing an adequate suppression after 1-mg-dexamethasone [second-day-plasma cortisol=0.93µg/dL(normal<1.8)], and normal baseline [ACTH=10.71pg/mL(normal:3-66)]. Zoledronate 5mg/year was offered (plus cholecalciferol supplementation). **Conclusion:** Adrenal adenomas, especially bilateral and in menopause, potentially impact the bone mass. However, in this case, as mentioned, other negative contributors to the overall fracture risk were identified.

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DIAGNOSTIC AND THERAPEUTIC CHALLENGES IN BRAF V600E POSITIVE POORLY DIFFERENTIATED THYROID CARCINOMA WITH SUSPECTED OSSEOUS METASTASES: A CASE REPORT

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Background: Poorly differentiated thyroid carcinoma (PDTC) is an aggressive malignancy associated with significant challenges in diagnosis and management, including cases with suspected bone metastases.
Objective: We aim to introduce such a case with PDTC and equivocal findings regarding osseous metastases, underscoring the complexities of imaging and therapeutic decision-making.
Results: A 57-year-old male presented rapidly enlarging goitre and bilateral latero-cervical lymph nodes involvement and normal thyroid function. Computed tomography revealed significant tracheal deviation. Total thyroidectomy with latero-cervical lymphadenectomy was performed. Pathological exam confirmed PDTC. Sanger DNA sequencing identified the *BRAF V600E* pathogenic variant. Postoperatively, thyroglobulin exceeded detectable limits (>500 ng/mL;normal:3.5–77), consistent with extensive residual/metastatic disease. Serum calcium dynamics showed decreasing postoperatively calcium levels (total serum calcium of 6.7 mg/dL) amid transient hypoparathyroidism. Whole-body iodine-131 scintigraphy highlighted intense radiotracer uptake in thyroid remnants, diffuse pulmonary and osseous metastases, including a lesion at the left parietal skull and costal determinations. However, the osseous lesions were not confirmed on 99mTc-HDP bone scintigraphy. Similarly, SPECT/CT revealed no definitive pathological uptake in bone, and findings were attributed to degenerative changes. Based on sustained iodine uptake, the decision was made to continue radioiodine therapy (initial dose of 100 mCi) postponing zoledronate.
Conclusion: Despite imaging discrepancies, the decision to con-

tinue intensive radioiodine therapy might help bone involvement at this point of evolution. Targeted therapy addressing positive *BRAF V600E* profile remains a further potential option. The extensive pulmonary dissemination, alongside unconfirmed osseous metastases, highlights the need for a multidisciplinary approach. This case underscores the challenges in diagnosing and managing osseous metastases in PDTC that requires a tailored approach.

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P899

IS THERE A DXA REFLECTION OF A MILD AUTONOMOUS CORTISOL SECRETION IN AN ADRENAL TUMOUR?

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Objective: One-third of apparently non-secreting adrenal tumors reveal mild autonomous cortisol secretion (MACS) which can negatively impact cardio-metabolic, and bone health, particularly in menopause. We aim to introduce such report. **Method**: case presentation. **Results:** This is a 66-year-old female (physiological menopause since the age of 52) admitted for the evaluation of bilateral adrenal masses (largest diameter on the right of 2.43cm, respectively, of 4.65cm on the left) that were incidentally discovered via ultrasound (performed for non-specific gastrointestinal complaints). On admission, impaired glucose tolerance (glycated hemoglobin A1c of 6.02%) was confirmed. Suppressed baseline ACTH [3.77pg/mL (normal:7.2-63.3)] and non-suppression of morning plasma cortisol following dexamethasone test [3.74mg/dL (normal<1.8)] pinpointed MACS. Computed tomography highlighted the same tumour diameters. Normal parathormone [54.93pg/mL (normal:15-65)] and total serum calcium[9.68mg/dL(normal:8.4-10.2)] associated a low 25-hydroxyvitamin D [11.6ng/mL (normal>30)]. Bone turnover markers were normal [osteocalcin=18.23ng/mL (normal:15-46), CrossLaps=0.45ng/mL (normal:0.33-0.782)]. Dual-Energy X-Ray Absorptiometry showed osteopenia [lumbar bone mineral density(BMD)=1.021g/cm^2,T-score=-1.4SD, Z-score=-0.9SD; femoral neck BMD=0.784g/cm^2, T-score=-1.6SD, Z-score=-1SD]. Bone microarchitecture was normal (TBS=1.358). Vitamin D supplementation was offered. In the absence of adrenal venous sampling (which was available), the decision to performing an adrenalectomy on the adrenal tumor (having +2cm larger diameter than the opposite, and overall >4cm) was done. **Conclusion**: Despite the absence of overt Cushing syndrome, MACS requires a careful evaluation of the cardio-metabolic-bone negative effects, including with respect to a potential post-adrenalectomy improvement. In particular, adrenal venous sampling is necessary for individuals with ACTH-independent MACS-positive bilateral adrenal tumors, especially in cases with similar sizes.

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P900

ASSESSMENT OF BONE DENSITY AND QUALITY IN A MALE PATIENT WITH FAMILIAL ISOLATED PRIMARY HYPERPARATHYROIDISM

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Background/objective: Primary hyperparathyroidism (PHPT) induces bone loss especially at cortical sites and impairs trabecular bone score (TBS) as bone microarchitecture measurement.

Factors commonly associated with PHPT such as metabolic syndrome, especially diabetes mellitus, may further impact the microarchitecture. We aim to introduce the bone health assessment in a case of familial isolated symptomatic PHPT. **Method**: This is a case report. **Results**: A 45-year-old male who complained of fatigability, constipation, and generalized bone pain and arthralgia was then confirmed with PHPT. The patient was overweight and had all the components of metabolic syndrome. His father also had suffered from PHPT (familial PHPT). On admission, PHPT was confirmed in terms of calcium=12.6mg/dL(normal:8.4-10.2), ionized calcium=5.73mg/dL(normal:3.9-4.9), phosphorus=1.6mg/dL(2.3-4.7) and PTH=352.3pg/mL(15-65). Bone turnover markers(BTM) were high in terms of resorption CrossLaps=2.16ng/mL(normal:0.158-0.442), and formation: osteocalcin=154.5ng/mL(normal:14-42), P1NP=261.9ng/mL(normal:20.25-58.59). DXA revealed osteopenia: lumbar BMD=1.097g/cm^2, T-score=-1.1, Z-score=-1.4, femoral neck BMD=0.973g/cm^2, T-score=-0.7, Z-score=-0.6, total hip BMD=0.946g/cm^2, T-score=-1.1, Z-score=-1, non-dominant third distal radius BMD=0.406g/cm^2, T-score=-2.3, Z-score=-2.3 and normal TBS of 1.390 with no prevalent fractures. In order to control hypercalcemia and to address the bone loss, intravenous zoledronate (4mg) was offered. Ultrasound showed a right parathyroid adenoma of 3.1 cm which was confirmed at SESTAMIBI-Tc99m scan. He underwent selective single parathyroidectomy and experienced post-operatory hypocalcaemia (total serum calcium=7.6mg/dL). Further serial check-up is mandatory. **Conclusion**: Despite markedly increased BTM and low BMD in the setting of PHPT-related symptomatic hypercalcemia, and further fracture risk factors such as metabolic syndrome components, this patient had no alteration of bone microarchitecture.

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P901

PITFALLS OF PARATHYROID TUMOUR LOCALIZATION AMID MULTIPLE ENDOCRINE TUMOURS SYNDROME

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Background/Objective:Multi-glandular parathyroid disease, pituitary and adrenal tumours are part of multiple endocrine neoplasia.Primary hyperparathyroidism(PHPT) affects the bone status, like some others co-tumours. We aim to introduce a male with PHPT-related multiple endocrine tumours.**Method:**This is a case report.**Results:**A 57-year-old patient with PHPT, and non-functioning pituitary adenoma(4.4x3.5mm) had metabolic syndrome.The patient was first diagnosed with PHPT at 47 [serum total calcium=11.3mg/dL (normal:8.4-10.2),PTH=115pg/mL(normal:11-67)] and had negative localization at MIBI-Tc99m parathyroid scintigraphy. Over the years, total calcium remained between 10.7-11.4mg/dL and PTH between 44.69-62.8pg/mL.At 56, DXA remained normal: lumbar BMD=1.198g/cm^2,T-score=-0.2,Z-score=-0.3, femoral neck BMD=1.127g/cm^2,T-score=0.4,Z-score=1.3, non-dominant third distal radius BMD=0.932g/cm^2,T-score=1.6,Z-score=2.6. 10-year risk assessment of major osteoporotic fracture was of 1.5% and 0.1% for hip fracture. Bone turnover markers showed reduced formation[osteocalcin=12.17ng/mL(normal:14-46)] and normal resorption [CrossLaps=0.27ng/mL(normal:0.104-0.504)].Currently, calcitonin was mildly elevated[20.9pg/mL(normal:1-11.8)] with normal thyroid ultrasound and the patients remained under thyroid surveillance. PHPT-related assays (a maximum total calcium of 10.8mg/dL) were stationary and computed tomography(CT) finally identified upper bilateral parathyroid tumours. Parathyroidectomy was postponed by the patient. Additionally, adrenal CT showed a tumour(10x1.08mm) with suppression at dexamethasone test[basal ACTH=18.14pg/mL(normal:3-66), plasma morning cortisol=7.39mg/dL(normal:6.2-19.4)]. Genetic testing was declined by the patient.**Conclusion**:A patient with long-standing hypercalcemia due to multi-glandular disease, with intermittently normal PTH levels over the years and poor tumour localization amid imaging investigations, associated with non-functioning pituitary and adrenal tumours might pose some challenges to the bone health. The impact normohormonal PHPT on bone mass is an open issue. Of note, calcium-based stimulation testing for mildly increased calcitonin might not be feasible in PHPT.

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P902

DISEASE MODIFYING OA DRUG (DMOAD) EFFECT OF A NUTRACEUTICAL COMBINATION CONTAINING N-ACETYL-GLUCOSAMINE (100 MG) IN EROSIVE HAND OSTEOARTHRITIS. OUR PRELIMINARY RESULTS

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Erosive Hand Osteoarthritis (EHOA) is a relatively frequent form of Hand Osteoarthritis, more common in over-fifty female patients. Classically EHOA affects the interphalangeal (IP) and Distal Interphalangeal (DIP) joints of the hands. It is characterized by an acute onset of pain and swelling, with functional impaired condition. Additional features include osteolytic lesions in subchondral bone with typical erosions of joints, producing the "gull-wing sign".

N-Acetyl-D-Glucosamine (GlcNAc) seems to be able to affect osteoclast differentiation and to reduce the expression of IL-1 beta, a Proinflammatory cytokine.

Material and Methods

Aim of our 60-month observation was to evaluate the benefits of a daily dose of a nutraceutical support containing 100 mg of N-Acetyl-D- Glucosamine (GlcNAc), beyond Glucosamine (500 mg), and Boswellia Serrata BOSCAR® (PCT/IB2024/051169) (100 mg), in 80 female outpatients, fulfilling ACR criteria, mean age 69.4 yrs and mean disease duration 8.2 yrs.

At baseline (T0) patients had a significant exceeding of 5.0 in VAS pain and radiographic central erosion in ≥ 1 joints. Hand function was assessed by Dreiser Functional Index.

Results

All patients performed 3 three-months cycles per year. They were evaluated after each treatment year.

At T1, almost 70% of patients had a satisfactory reduction on a VAS Scale and Dreiser's scores showed an improvement.

At the last control (T5), more than 80% of patients reported a significant control of pain, reduction of swelling and a better joint function.

Conclusion

In our patients, GlcNAc reduced progression of erosive osteoarthritis and symptoms. It could be considered as a Disease-modifying OA drug (DMOAD).

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P903

ASSOCIATION OF OSTEOGENESIS IMPERFECT AND COOLEY'S ANEMIA, AN UNPRECEDENTED SITUATION!

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Introduction:

Osteogenesis imperfecta (OI), or brittle bone disease, is characterized by bone fragility and osteopenia. It associates skeletal and extra-skeletal signs.

Cooley's anemia is homozygous form of beta-thalassemia.

We report a situation where these two pathologies coexist.

Observation:

31-year-old female patient from a non-consanguineous marriage, with a family history of heterozygous beta-thalassemia and osteogenesis imperfecta. She has a homozygous B- thalassemia with iron chelation and transfusions complicated by hemochromatosis with primary amenorrhea, hypoparathyroidism and hepatomegaly, treated in rheumatology for OI type IV according to Sillence and Glorieux classification by intravenous bisphosphonates since the age of 18 years, stopped because of secondary hypocalcemia to the hypoparathyroidism.

Physical examination reveals failure to thrive, gray skin, pectus carinatum, scoliosis, lower limbs curvature, yellow opalescent teeth and enlarged abdomen.

Biology:

Normocytic normochromic anemia

Hypocalcemia, hypoparathyroidism, hypovitaminosis D, normal alkaline phosphatase and normal phosphatemia.

Radiology:

Diffuse demineralization, the pelvis in the heart of playing card, fish vertebrae, Looser fracture on the femoral shaft, hair-on-end appearance of the skull, a gridded appearance of the epiphyses.

Bone densitometry:

Z-score: -2.5 at the neck and spine

The patient received a treatment for hypocalcemia and hypovita-

minosis D, then in addition intravenous biphosphonate with tight control.

Discussion:

OI is a rare genetic disorder with autosomal dominant or recessive transmission, caused by mutations in chromosomes 7 or 17 encoding the chains of type I collagen fibers, with polymorphic clinical expression, which is not particularly associated with other diseases.

Cooley's anemia is also a genetic disease due to β globin gene mutation on the chromosome 11, it is autosomal recessive transmission. Like OI, it is not known to have any associations with other diseases.

P904

CLINICAL MANIFESTATIONS OF HYPOTHYROIDISM IN FEMALE PATIENTS WITH RHEUMATOID ARTHRITIS: A CROSS-SECTIONAL STUDY OF 58 CASES

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Introduction

Rheumatoid arthritis (RA) is a chronic autoimmune inflammatory disease primarily affecting the joints, though it can also involve various organ systems. Among its associated comorbidities, thyroid disorders, particularly hypothyroidism, are frequently reported.

Objectives

- Describe the various clinical manifestations of hypothyroidism in the course of rheumatoid arthritis (RA).
- Outline the biological and immunological profile of thyroid involvement in RA.

Patients and Methods

This cross-sectional study included female patients with RA, meeting the ACR-EULAR 2010 criteria. Thyroid function tests (thyroid-stimulating hormone (TSH) and free thyroxine (FT4)) and assays for antithyroid antibodies (ATAs) (anti-thyroglobulin antibody (ATG), anti-thyroperoxidase antibody (ATPO), and anti-TSH receptor antibody (ARTSH)) were conducted.

Results

Fifty-eight RA patients were included in our study, of whom 17% (n=10) had hypothyroidism. The mean age of these patients was 54.3 ± 13.72 years [30.1–68.16].

The clinical manifestations of hypothyroidism observed, in order of frequency, were: physical fatigue (n=7), hair loss (n=6), mental fatigue (n=3), drowsiness (n=3), dry skin (n=4), hair thinning (n=3), constipation (n=2), weight gain (n=1), and cold intolerance (n=1). No patients exhibited bradycardia, cramps, or myxedema.

The average values for FT4, TSH, ATPO, ATG, and ARTSH were 24.95 ± 26.6 pmol/L, 3.14 ± 2.41 mIU/L, 37.21 ± 66.53 IU/mL, 69.37 ± 127.4 IU/mL, and 0.94 ± 0.32 IU/L, respectively.

Antithyroid antibodies were positive in 3 patients: one patient had both ATPO and ATG positivity, another had positive ARTSH, and the third had positive ATPO.

Conclusion

Our study reveals a prevalence of hypothyroidism in RA patients estimated at 17%, consistent with data in the literature. The most frequently observed symptoms were fatigue and hair loss. Thyroid monitoring is recommended, especially in cases with suggestive symptoms.

P905

GENDER DISPARITIES IN QUALITY OF LIFE IN RHEUMATOID ARTHRITIS

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Background/Aims: Rheumatoid arthritis (RA) is the most common chronic inflammatory rheumatism in adults. Through chronic inflammation and joint deformities, RA leads to functional, socio-economic, and psychological consequences that can negatively impact the quality of life (QoL) of patients. **Objective**: To investigate whether there is a difference in the impact on QoL between male and female RA patients. **Methods:** We conducted a cross-sectional study including 60 patients diagnosed with RA according to the 2010 ACR-EULAR criteria. RA activity was assessed using the Disease Activity Score (DAS28). QoL was measured using the Short Form 36 (SF-36) score, a questionnaire with 36 items exploring eight dimensions: physical functioning (PF), role limitations due to physical health (RP), role limitations due to emotional problems (RE), vitality, emotional well-being, social functioning (SF), bodily pain, and general health perceptions. A score ranging from 0 to 100 was calculated, with a lower score indicating poorer QoL. **Results:** We included 60 RA patients: 40 women (F) with a mean age of 52.12±9.32 years and 20 men (M) with a mean age of 48.45±12.79 years. The age difference was not statistically significant (p=0.263). The average disease duration was longer in women (M: 7.55±6.43 vs F: 11.41±8.33 years, p=0.05). The DAS28 score was higher in men (M: 3.88±0.8 vs F: 3.46±0.89, p=0.314). Women had a significantly lower overall SF-36 score (M: 55.85±11.38 vs F: 44.63±9.27, p < 0.001). Men scored higher in physical functioning (M: 56.18±11.09 vs F: 46.65±10.79, p=0.003), role limitations due to physical health (M: 50.93±12.16 vs F: 44.71±9.39, p=0.002), vitality (M: 52.64±12.34 vs F: 42.86±9.95, p=0.002), role limitations due to emotional problems (M: 54.43±9.1 vs F: 44.63±9.66, p < 0.001), and social functioning (M: 54.34±8.61 vs F: 44.68±9.47, p < 0.001). No significant differences were noted between the two groups in emotional well-being (p=0.393), bodily pain (p=0.450), or general health perception (p=0.074). **Conclusion:** Our study highlighted a more pronounced decline in QoL among female RA patients, consistent with previous findings in the literature. These patients require more comprehensive and attentive management of the disease to ensure better QoL and, consequently, a more effective therapeutic response.

P906

RHEUMATOID CEREBRAL VASCULITIS : A SCARCE YET SERIOUS COMPLICATION

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Background/Aims: Rheumatoid arthritis (RA) is a chronic systemic inflammatory disease that primarily affects the joints but can also involve various extra-articular organs, including the cardiovascular, pulmonary, and nervous systems. One of the rare but serious neurological complications of RA is rheumatoid cerebral vasculitis (CV), which occurs in a subset of patients, typically those with long-standing erosive seropositive disease. Rheumatoid CV is a potentially life-threatening condition characterized by inflammation and damage to the small and medium-sized vessels of the central nervous system, leading to a wide range of neurological symptoms.
Methods: Herein, we present a rare case of a cerebral vasculitis (CV) in patient with long standing RA managed using cyclophosphamide and steroids.
Results: Our patient is a 59-year-old female patient with a 20-year-history of erosive seropositive rheumatoid arthritis treated with methotrexate at a dose of 10 mg per week and a daily corticosteroid therapy of 5 mg prednisone. She complained of sudden onset severe headaches accompanied by persistent bilateral visual blurring for 15 days. Neurological examination did not reveal any meningeal signs. Temporal artery pulses were present. Fundoscopy showed no papillary edema. Joint examination revealed arthritis in both knees and synovitis of the bilateral 2nd and 3rd metacarpophalangeal joints. Biological work-up revealed elevated C-reactive protein (CRP) level of 57mg/L and erythrocyte sedimentation rate (ESR) levels of 135 mm/hour. Immunological assessment was positive for rheumatoid factor, anti-CCP antibodies, and antinuclear antibodies. Anti-DNA and anti-neutrophil cytoplasmic antibodies were negative. Serologies for human immunodeficiency virus, hepatitis B, and hepatitis C were negative. Magnetic resonance imaging showed dot-like areas of high-signal in a periventricular subcortical distribution on both sides consistent with vasculitis lesions. Based on these findings, the diagnosis of rheumatoid cerebral vasculitis was made. The patient was Pulse therapy with methylprednisolone (1g/d for 3 days) and cyclophosphamide (1 g) once a month. For her RA, methotrexate treatment was increased to 15 mg per week. We noted at 6-month follow-up disappearance of headaches, normalization of CRP to 2 mg/L and ESR to 39 mm/hour, and regression of supratentorial lesions on follow-up MRI.
Conclusion: CV tends to occur more often in patients with long-standing seropositive RA , as was the situation with our patient. The clinical manifestations of CV are diverse. Our patient experienced acute headache and blurred vision. Nevertheless, other symptoms can include hemiplegia, partial epilepsy, cranial nerve involvement, visual field loss, altered consciousness, confusion, and cognitive impairment or dementia.

P907

PRO-INFLAMMATORY CYTOKINES IN PSORIATIC ARTHRITIS AND THEIR IMPLICATION IN DISEASE ACTIVITY

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Background/Aims: Psoriatic arthritis (PsA) is a chronic immune-related inflammation that affects joints, enthesis, skin and nails. Its pathology is complex and implicates several cytokines. We aimed to determine the pro-inflammatory cytokines serum levels in psoriatic arthritis and their relationship to the disease activity.
Methods: We conducted a cross-sectional study that compared patients diagnosed with psoriatic arthritis (G1) according to the Assessment of SpondyloArthritis International Society (ASAS) and/Or ClASsification criteria for Psoriatic ARthritis (CASPAR) with a Control group (G0). Sociodemographic parameters were collected. Disease activity was assessed by using the Ankylosing Spondylitis Disease Activity Score (ASDAS) and the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI). We measured serum levels of the following cytokines: interleukin17 (IL17), interleukin22 (IL22), interleukin1 (IL1), interleukin6 (IL6), interleukin23 (IL23), and Tumor Necrosis factor (TNFα).
Results: Each group included 31 patients. G1 had 21 men and 10 women and G2 had 24 men and 7 women. There was no significant age difference between the groups (G1= 47.29±15.55 vs 43.193±9.31 years, p=0,124). BASDAI and ASDAS mean scores were 3,72±1,96 and 2,91±1,41, respectively. The level of IL6 and TNF-α was higher in patients from G1 in comparison with G2 (serum concentration mean values of IL-6 were: G1=14,91 vs G2=1,96 pg/ml and TNF-α G1=20,45 vs G2=7,31 pg/ml. however, the results were not statistically significant (p> 0.05). The following interleukins were significantly higher in patients with PsA: IL1 (G1=5,75 vs G2=4,00 pg/ml, p=0.028), IL17 (G1=116,74 vs G2=1,08 pg/ml, p<0.000), IL22 (G1=47,12vs G2=10,63 pg/ml, p=0.001) and IL23 (G1=27,27 vs G2=1,59 pg/ml, p<0.000). We noted that BASDAI score was correlated to TNF-α serum level (r=0.543, p=0.016). ASDAS score was correlated with IL1 (r=0.448, p=0.048), IL6 (r=0.469, p=0.037), IL17 (r=0.451, p=0.046), and IL22 (r=0.464, p=0.039) serum levels.
Conclusion: In this study, we found that IL-1, IL-17, IL-22, and IL-23 levels were significantly higher in patients with psoriatic arthritis compared to controls. Additionally, disease activity scores (BASDAI and ASDAS) were correlated with the serum levels of TNF-α, IL-1, IL-6, IL-17, and IL-22. These results suggest that pro-inflammatory cytokines play a critical role in PsA and could serve as potential targets for disease management.

P908

NEUROPATHIC ARTHROPATHY OF THE KNEE AS A SEQUELA OF UNDIAGNOSED TERTIARY SYPHILIS

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Background/Aims: Tabetic arthropathy is a neurogenic destructive condition secondary to infection by the treponema. It affects 4 to 10% of tabetics.
Methods: We report a new case of knee involvement in tertiary syphilis.
Results: A 53-year-old patient, with no medical history, was admitted for exploration of right knee pain with swelling evolving for 7 months, without history of trauma or fever. There was a history of untreated superficial and painless genital ulceration that appeared 20 years ago and multiple unprotected sexual intercourses. On examination, the right knee was swollen, painless, and without local inflammatory signs. Neurological examination revealed a peripheral neurogenic syndrome in both lower limbs (absent Achilles reflex on the right and decreased on the left) without posterior cord syndrome or pyramidal syndrome. Laboratory tests revealed lymphopenia at 1300 cells/mm3 and a mild biological inflammatory syndrome. Standard right knee radiograph showed internal femoro-tibial narrowing with osteolysis of the internal femoral condyle and medial edge of the internal tibial plateau, associated with multiple bone formations and intra-articular fragments. Knee computed tomography concluded a hypertrophic form of neurogenic osteoarthropathy. As part of the etiological investigation, craniospinal magnetic resonance imaging was normal. Syphilitic serology was positive with TPHA at 1/1280 and VDRL ++. Lumbar puncture revealed hyperproteinorrhea at 0.7g/L associated with a TPHA levels >1/64 and VDRL ++. Thus, the diagnosis was tabetic arthropathy of the right knee associated with neurosyphilis. The patient was treated with Penicillin G at a dose of 6 million units x 4/day intravenously for 15 days.
Conclusion: Tabes dorsalis, a late tertiary neurosyphilis manifestation, arises in 2%-9% of untreated cases. Tabetic arthropathy develops in 6%-10%, sometimes appearing three decades post-primary syphilis. Diagnosis often relies on radiological evidence alongside positive serological/spinal fluid tests.

P909

DIAGNOSTIC YIELD OF DISCO-VERTEBRAL BIOPSY IN INFECTIOUS SPONDYLODISCITIS

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Background/Aims: Infectious spondylodiscitis (ISD) is a rare condition with an increasing incidence due to extended life expectancy, an increase in the susceptible population, and improvement in investigations. We aimed in this study to assess the contribution of disco-vertebral biopsy (DVB) in the etiologic diagnosis of ISD.
Methods: We conducted a retrospective descriptive study involving 80 patients diagnosed with infectious spondylodiscitis, all seen in a Rheumatology department over 7 years [2016-2023]. Epidemiological, clinical, biological, and anatomopathological data were collected.
Results: Our study included 80 patients with a mean age of 57.29 years ± 15.36 and a gender ratio (M/F) of 1. Comorbidities were present in 30 patients (37.5%) as follows: diabetes (n=30), hypertension (n=19), hemodialysis (n=7), cancer (n=6), and dyslipidemia (n=5). The average duration of symptom evolution was 2.75 months. Ninety-two percent of patients experienced spinal pain, 46% weight loss, 43% fever, 39% general weakness, and 37.5% anorexia. Raised inflammatory marker was seen in 76% of cases, with mean values of C-reactive protein and erythrocyte sedimentation rate at 77.35 ± 81.8 mg/l and 62.9 ± 33.9 mm, respectively. Disco-vertebral biopsy was performed in 22 cases. For other cases, the identification of the pathogen agent was made based on blood cultures (n=15), soft tissue (n=25) biopsy, and positive Wright serology (n=10). No germ was incriminated in 15 cases. Disco-vertebral biopsy was contributory in 68% of cases (n=15), revealing: giant-cell granuloma with caseous necrosis (41%,n=9), granulomatous reaction (9%,n=2), and non-specific inflammatory infiltrate (50%,n=11). DVBD allowed the identification of common pathogens in 3 patients (Staphylococcus, Streptococcus, Enterococcus) and the extraction of Brucella DNA through Polymerase Chain Reaction (PCR) in one patient.
Conclusion: Our study showed that DVB was necessary in only 72,5 % of cases when other investigations were non-conclusive. Despite its invasive nature, DVB contributed significantly to identifying the causative micro-organism of infectious spondylodiscitis and aids in guiding effective therapeutic management.

P910

TELEWORKING VS. ON-SITE WORK: INSIGHTS INTO THE PREVALENCE AND SEVERITY OF MUSCULOSKELETAL DISORDERS

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Background
Musculoskeletal disorders (MSDs) are a prevalent occupational health issue, further intensified during the COVID-19 pandemic due to the rapid shift to teleworking [1]. This change in work environments has raised concerns about its impact on employee health.
Objectives
This study aimed to evaluate the prevalence of MSDs among employees during teleworking and on-site work and to compare the intensity of these disorders between the two work settings.
Methods
Data collection was performed using an online questionnaire distributed via Google Forms. Participants included employees who

had experience in both on-site work and teleworking. Key variables included demographic characteristics, work duration, frequency and length of breaks, and device usage. The validated French version of the Nordic Musculoskeletal Questionnaire (NMQ) was employed to assess the presence and impact of MSDs [2].

Results

A total of 145 employees participated in the study. The sex ratio was 1.01 (73 males/72 females), with an average age of 33 ± 8 years. Participants had been working at their company for an average of 7 ± 6.5 years. The mean duration of telework experience was 16±14 months.

Regarding work schedule, employees reported an average of 7±1 hours of daily work in both settings, with 72% working 5 days per week on-site and 65% working 5 days per week during teleworking. The average daily break time was 73±39 minutes on-site and 79±10 minutes during telework. Most participants used a laptop for work (88% on-site; 90% during telework).

During on-site work, 75% of participants (n=108) reported MSDs. The most affected regions were the lower back (64%, pain level 5±3), upper back (63%, pain level 4±3), and neck (60%, pain level 5±3). While during teleworking, 90% of participants (n=130) reported MSDs. The most affected regions were the lower back (78%, pain level 5±3), upper back (68%, pain level 4±3), and neck (69%, pain level 4±3).

The prevalence of MSDs was statistically higher during teleworking than during on-site work (p=0.04), particularly regarding the lower back (p=0.03), hips (p=0.001) and ankles (p=0.04).

Conclusions

The prevalence and intensity of MSDs were significantly higher during teleworking compared to on-site work. These findings highlight the need for targeted interventions, including ergonomic adaptations and education on healthy work practices, to mitigate the risk of MSDs in teleworking environments.

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P911

IMPACT OF TELEWORKING ON THE PREVALENCE AND RISK FACTORS OF MUSCULOSKELETAL DISORDERS

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Background

The incidence of musculoskeletal disorders (MSDs) in the workplace has significantly increased in recent years, particularly with the widespread adoption of teleworking. This shift, accelerated by events such as the COVID-19 pandemic, has raised concerns about the ergonomic and health implications of remote work environments [1,2].

Objectives

This study aimed to evaluate the prevalence of MSDs among employees during teleworking, identify associated risk factors, and assess the impact of work conditions on these disorders.

Methods

Data collection was performed using an online questionnaire distributed via Google Forms. Participants included employees who had experience in both on-site work and teleworking. Key variables included demographic characteristics, work duration, frequency and length of breaks, and perceived stress levels. The validated French version of the Nordic Musculoskeletal Questionnaire (NMQ) was employed to assess the presence and impact of MSDs.

Results

A total of 145 employees participated in the study. The sex ratio was 1.01 (73 males/72 females), with an average age of 33±8 years. Participants had been working at their company for an average of 7±6.5 years, with a mean telework duration of 16±14 months. During teleworking, employees reported an average of 7±1 hours of daily work, with 65% working 5 days per week. The average daily break time was 79±10 minutes. 90% of teleworkers used a laptop, with 70% for 6 hours or more per day. The average perceived stress level among teleworkers was 5±2.

MSDs were reported by 90% of teleworkers (n=130). The most affected regions were the lower back (78%, pain level 5±3), upper back (68%, pain level 4±3), and neck (69%, pain level 4±3). The prevalence of MSDs during teleworking was influenced by the total duration of teleworking (p=0.01), the number of breaks (p=0.01), the break duration per day (p=0.03), the time spent on a laptop (p=0.01) and the perceived stress levels (p=0.001).

Conclusions

The findings demonstrate a high prevalence of MSDs during teleworking, with significant associations with work habits, stress, and ergonomic factors. These results underscore the need for targeted interventions, including ergonomic adjustments, structured breaks, and stress management strategies, to mitigate the risks of MSDs in teleworking environments.

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P912

DIABETIC BONE PARADOX AND PREVALENT VERTEBRAL FRACTURES: A CROSS-SECTIONAL STUDY OF 504 HIP-FRACTURE WOMEN

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OBJECTIVE. Hip fractures occur at higher BMD in the women with type 2 diabetes mellitus (T2DM) than in controls, consistently with the diabetic bone paradox, i.e., high risk of fracture despite high bone mineral density (BMD). However, no studies have addressed BMD in women with T2DM who have prevalent vertebral fractures at the time of their first hip fracture. We aimed to test the hypothesis that BMD levels could be higher in the hip-fracture women with versus without T2DM in the absence but not in the presence of prevalent vertebral fractures.
MATERIAL AND METHODS. We investigated 504 hip-fracture women with and without prevalent vertebral fractures. At a median of 19 days after the hip fracture we assessed femoral BMD by dual-energy x-ray absorptiometry and prevalent vertebral fractures by x-ray examination.
RESULTS. The 185 women without vertebral fractures had BMD higher in the presence (N=29) than in the absence (N=156) of T2DM (mean T-score difference was 0.67, 95% CI from 0.31 to 1.03, P<0.001). After adjustment for 8 potential confounders, the odds ratio to have densitometric osteoporosis for a woman without T2DM was 3.21 (95% CI from 1.10 to 9.33, P=0.032). On the contrary, in the 319 women with vertebral fractures T2DM was not associated with BMD.
CONCLUSIONS. At the time of an original hip fracture, we found a BMD gap between women with and without T2DM in the absence but not in the presence of prevalent vertebral fractures. Adjustments of fracture risk calculation in T2DM have been authoritatively suggested, because high BMD levels may falsely lead to risk underestimation. Our data suggests that no adjustments may be needed for the risk estimation in patients with prevalent vertebral fractures. Further data from longitudinal studies are needed to define the role of both prevalent vertebral fractures and BMD in fracture risk of patients with T2DM.

P913

FALLS EFFICACY BUT NOT FEAR OF FALLING AFFECTS THE FUNCTIONAL RECOVERY AFTER HIP FRACTURE: A SHORT-TERM PROSPECTIVE SYUDY

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OBJECTIVE. To assess the role of falls efficacy (one's perceived ability to undertake activities without falling) and its independence from fear of falling assessed by a single question in affecting the functional recovery after a fall-related hip fracture.
MATERIAL AND METHODS. We focused on inpatients admitted to our rehabilitation ward after a fall-related fracture of the hip. Falls efficacy in various activities of daily living was assessed at rehabilitation admission by using the Falls Efficacy Scale International (FES-I, full version with 16 items), whereas fear of falling (FoF) was investigated by a 4-level single question ("Are you afraid of falling?"). At the end of the subacute rehabilitation course, we measured functional independence by using the Barthel index. Successful rehabilitation was defined with a Barthel index score ≥ 85. The patients with cognitive impairment on the Short Portable Mental Status Questionnaire were excluded from the study.
RESULTS. The study sample included 186 consecutive inpatients. At bivariate analysis, a significant inverse correlation was found between FES-I scores assessed on admission to rehabilitation and Barthel index scores evaluated at rehabilitation discharge: r=-0.248; P=0.001. The significant association between FES-I and Barthel index scores persisted after adjustment for 9 variables: age, sex, hip-fracture type, 25-hydroxyvitamin D, prevalent neurologic impairment, concomitant upper limb fractures, pressure ulcers, pre-fracture Barthel index, and FoF (P<0.001). For the patients with a low FES-I score (< 50th percentile) the adjusted odds ratio for achieving successful rehabilitation was 4.24 (95% CI from 1.75 to 10.25, P=0.001) versus the patients with FES-I scores ≥ 50th percentile.
CONCLUSIONS. Falls efficacy investigated by FES-I, but not fear of falling, significantly affects the functional recovery following a fall-related fracture of the hip and should be routinely assessed in the subacute setting.

P914

UNVEILING A RARE GENETIC ANOMALY: NEW MUTATION IN ACRO-DENTO-OSTEO DYSPLASIA LINKED TO HAJDU-CHENEY SYNDROME

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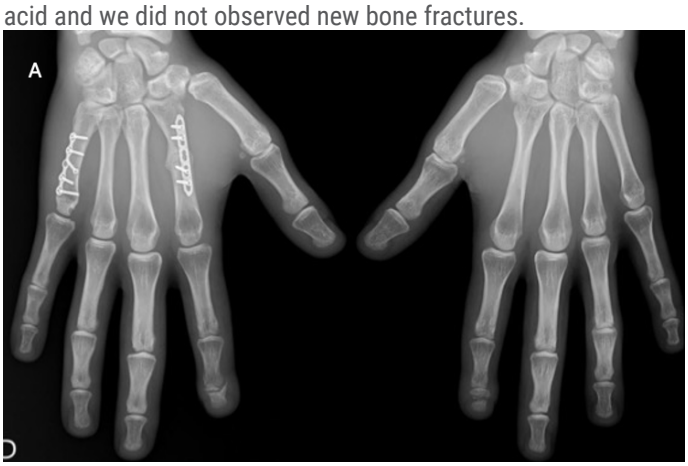
Introduction:
Hajdu-Cheney syndrome (acro-dento-osteo-dysplasia syndrome), is a rare genetic disorder whose prevalence is less than one person in one million.

Presentation:
A 20-years-old man presented with a 2-years history of bone fractures, both high and low impact (metacarpals and distal phalanges of hands), and of maxillary bone resorption after tooth extraction. Anamnesis was negative for inflammatory rheumatic disease. Past medical history included hear surgery due to hearing loss and chronic snoring with diagnosis of sleep apnea at the age of 11 (from ages 11 to 13, the patient used a device to widen the palate). There was no relevant family history. He had coarse voice, retrognathia, downslated palpebral fissures, long philtrum, full cheek, hypertelorism and digital pseudoclubbing, without peripheral arthritis. Blood and urine tests were normal. Radiological examination showed band osteolysis in the 2nd distal phalanges of both hands, acroosteolysis of all distal phalanges in the hands and feet, erosions in the first metatarsophalangeal joint and osteosynthesis material in 2ndand 5th metacarpals (Fig. 1). DXA detected low vertebral bone mineral density (*Z-Score*: -2,85 SD). A congenital osteolysis syndrome was suspected. The genetic study detected a mutation not previously described in the NOTCH2 gene [variant c.6596dup, P.(Ser22001lefs*4)] which it would be expected to have a deleterious impact. Considering all the findings, the diagnosis of Hajdu-Cheney syndrome was made. Treatment with zoledronic acid (5 mg intravenous, annually) was started. Currently, he has received two infusions of zoledronic acid and we did not observed new bone fractures.



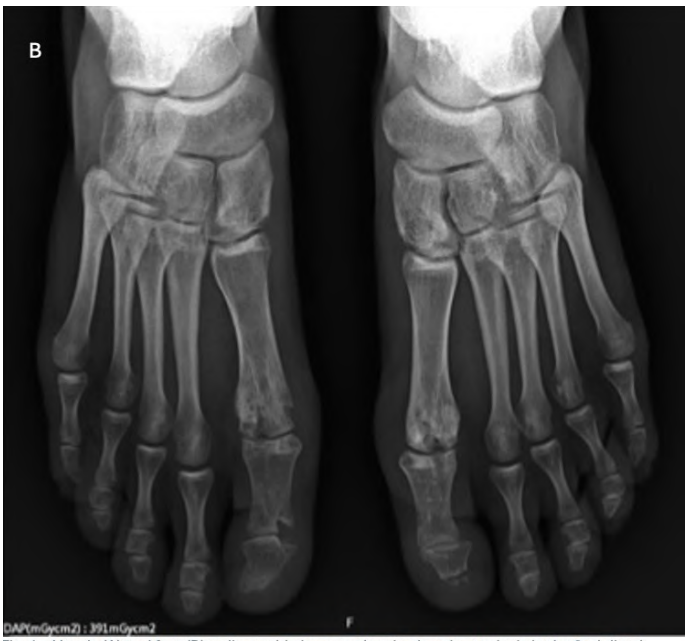


Fig. 1 – Hands (A) and feet (B) radiographic images showing band osteolysis in the 2nd distal phalanges of both hands, acroosteolysis of all distal phalanges in the hands and feet, erosions in the first metatarsophalangeal joint and osteosynthesis material in 2nd and 5th metacarpals.

Discussion:
HCS is characterized by generalized osteoporosis and focal bone loss (acro-osteolysis and dental). It is associated with cranial, facial, musculoskeletal and, sometimes, cardiovascular alterations. According to *ORPHANET*, less then 100 cases are registered. Clinical presentation varies from early infancy to late adulthood, worsening over time because of its age-dependent evolution. Bone fragility is an important issue in management comorbidities. Anti-resorptive treatment (bisphosphonates) may offer a beneficial option to treat osteoporosis and prevent new bone fractures. As this disease is particularly rare, the accumulation of clinical reports is extremely important. We report the second case of HCS in Portugal with a new mutation which has not been previously identified.

P915

LONG-TERM FRACTURE INCIDENCE AND PREDICTORS IN SYSTEMIC LUPUS ERYTHEMATOUS PATIENTS: DATA FROM REUMA.PT

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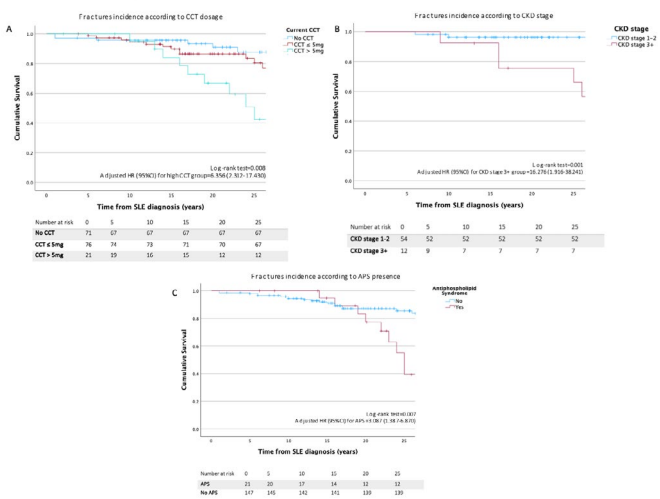
Objectives:
Patients with systemic lupus erythematous (SLE) have an increased bone fragility and fracture risk. We aimed to study the prevalence and risk factors for fractures in a portuguese population with SLE.

Methods:
Retrospective single-center study including patients with SLE diagnosis according to the 2019 EULAR/ACR classification criteria extracted from Reuma.pt/SLE (portuguese national registry). Patients were excluded if they were lost to follow-up for reasons other than death. Vertebral radiographies and clinical registries were reviewed for fractures.

Results:
A total of 170 patients with SLE were included, mostly female (n=156, 75%). Mean age at diagnosis was 32.1±13.5 years old, median follow-up time was 22 (15.4-30.2) years, and the mean current age was 54.1 ±12.6 years old. Current corticosteroid (CCT) dosage was 2.5 (0-5.0) mg prednisolone equivalent, 84 (49.4%) patients were currently taking classic disease modifying rheumatic drugs (DMARDs) and 24 (14.1%) biologic DMARDs. A total of 71 patients (34.1%) were no longer under CCT. Thirty-three (15.9%) fractures occurred during follow-up, 23 (11.1%) patients had densitometric osteoporosis and 30 (17.6%) were under anti-osteoporotic treatment.
Patients who sustained fractures were older (p=<0.001), had more frequent hypertension (p=0.003), diabetes (p=0.011) and antiphospholipid syndrome (APS, p=0.017). Most women with fractures were post-menopausal (n=26, 81.3%). The current CCT dosage was higher in patients with fractures (p=<0.001). The occurrence of major cardiovascular events (p=0.048) and death (p=0.008) were also more prevalent in the fractures group. Amongst patients with renal involvement, a chronic kidney disease (CKD) stage ≥ 3 was associated with fractures (p<0.001).
In the survival analysis, patients under a CCT dosage > 5mg, lupus nephritis with CKD stage ≥3 and patients with associated antiphospholipid syndrome had a significantly higher incidence of fractures during follow-up (Figure 1). When adjusting for current age, lupus nephritis CKD stage ≥ 3 (HR 16.276 CI 95% 1.916-38.241, p=0.011), higher corticosteroids dosage (HR 6.356 CI 95% 2.312-17.430, p=<0.001), the presence of densitometric osteoporosis (HR 2.406 CI 95% 1.042-5.553, p=0.040) and APS (HR 3.087 CI 95% 1.387-6.870, p=0.006) independently predicted the occurrence of fractures during follow-up.

Figure 1 - Fracture survival analysis according to (A) CCT dosage, (B) CKD stage, (C) APS presence



Footnote: CCT – corticosteroids; SLE – systemic lupus erythematous; HR – hazard ration; CKD – chronic kidney disease; APS – antiphaspholid syndrome

Discussion:
SLE lupus nephritis patients with worse renal function, with concurrent antiphospholipid syndrome and under prednisolone >5mg/daily appear to be particularly at high-risk for fractures and may warrant an earlier and more vigilant fracture prevention strategy.

P916

FRACTURE INCIDENCE AND RISK FACTORS IN PERITONEAL DIALYSIS PATIENTS

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Objectives:
Predicting fracture risk in chronic kidney disease (CKD) patients is still a challenge in clinical practice. Particularly in peritoneal dialysis (PD), there is scarce evidence about fracture incidence and risk. The aim of this study was to evaluate the incidence of fractures in a cohort of PD patients and its association with risk factors.

Materials and Methods:
This was an observational, retrospective, single-center study of a cohort that received PD for a period ≥ 12 months. Patients were excluded if they received hemodialysis and/or had renal transplantation before the period of PD. Data from yearly blood tests and clinical evident fractures were collected. FRAX was calculated with the *web-based* FRAX tool including CKD as secondary osteoporosis. Radiographies of the thoracic and/or lumbar spine were evaluated for vertebral fractures.

Results:
A total of 184 patients were included with a median PD vintage of 43 (26-66.8) months. Mean age at the beginning of PD was 52.7 (14.3) years and 51.1% (n=94) were males. Twenty-two (12%) fractures were identified (incidence rate of 33/1000 patient-year). Patients with fractures during follow-up were older (p<0.001), had longer PD vintage (p=0.021), had a lower body mass index (BMI) (p=0.009), and more incidence of previous fractures (p=0.007). Additionally, they had lower (but normal) phosphorus levels (p<0.001) and lower parathyroid hormone (PTH) levels (p=0.019), with more patients in the group with PTH levels ≤ 150pg/mL (p=0.038). The vascular calcification score (VCS, Adragao) was higher in patients with fractures (p=0.007). During follow-up, patients with fractures had a higher death rate (p=0.022). FRAX was significantly higher in the group with fractures, with 4 (26.7%) of the patients with a high fracture risk (p=0.040). Area under the curve for major fracture risk was 0.755 (95% CI 0.651-0.858).
When adjusting for the existence of previous fractures (the factor with most impact in the outcome), older age, time on PD, lower BMI, lower PTH, and higher FRAX score independently predicted the occurrence of fractures (table 1). VCS also increased the odds of sustaining a fracture, but this did not achieve significance.

Table 1 - Regression models for outcome variable (Fractures, n=22)

	Univariate logistic regression				Multivariate logistic regression			
Parameters	OR	OR lower 95% CI	OR upper 95% CI	p-value	OR	OR lower 95% CI	OR upper 95% CI	p-value
Age	1.047	1.012	1.084	0.009*	1.038	1.002	1.076	0.038*
PD vintage (months)	1.013	1.001	1.026	0.034*	1.016	1.004	1.029	0.011*
BMI	0.928	0.876	0.980	0.008*	0.925	0.874	0.979	0.007*
Previous fracture	7.598	2.095	27.551	0.002*	--	--	--	--
PTH	0.996	0.993	0.999	0.010*	0.997	0.994	1.000	0.036*
PTH (≤150 vs >300pg/mL)	5.862	1.255	27.368	0.024*	5.075	1.017	25.327	0.048*
Phosphorus	0.451	0.254	0.804	0.007*	0.501	0.279	0.909	0.023*
VCS	1.186	1.006	1.397	0.042*	1.179	0.996	1.397	0.056
VCS (≥3)	2.512	0.993	6.358	0.052*	2.148	0.814	5.671	0.123
FRAX without BMD for major fracture	1.001	1.000	1.002	0.019*	0.019	1.001	1.003	0.012*
FRAX without BMD for hip fracture	1.001	1.000	1.002	0.006*	1.002	1.001	1.003	0.004*

Footnote: *statistically significant, p<0.05; **adjusted for previous fracture
PD: peritoneal dialysis; PTH: parathyroid hormone; VCS: vascular calcification score; FRAX: Fracture risk assessment; BMD: bone mineral density; OR: odds ratio; CI: confidence interval

Discussion:
In this young and equally sex-distributed cohort of PD patients, fracture incidence was high, and its risk increased with age, PD vintage and PTH levels ≤150pg/mL. FRAX had a good performance in predicting fractures.

P917

SARCOPENIA PREDICTS POORER MOBILITY AFTER HOSPITALIZATION WITH A FRAGILITY HIP FRACTURE

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Objectives
Sarcopenia and osteoporosis are associated with aging and represent a major health burden, leading to poor functional outcomes and death. We aimed to study the prevalence of sarcopenia after a fragility hip fracture and its association with mobility (elderly mobility scale – EMI), quality of life (Health Assessment Questionnaire – HAQ and EQ5D) and death.

Material and Methods
Cross-sectional single-center study including patients ≥ 50 years old with a fragility hip fracture registered in the portuguese national registry of rheumatic patients (reuma.pt), integrated in the Fracture Liasion Service, with an evaluation of hand-grip strength, anthropometry (calf circumference – CC or mid-upper arm circumference - MUAM), EMI, HAQ and EQ5D in up to 6 months after the fracture. Sarcopenia was diagnosed when low grip strength and low muscle quantity were present.

Results
172 patients were included, mostly female (n= 139, 80.8%) and with a current age of 70 (2.83) years old. All patients were hospitalized after the fracture and 72.7% of the surgeries occurred in the first 48h. After discharge, 42 (24.4%) patients were referred to nursing homes. Half of the patients (n=88) performed physical rehabilitation after discharge and 2 patients died. Low muscle strength was present in 77 (44.8%) patients. According to anthropometry, 96 (55.8%) patients had low muscle quantity. A diagnosis of sarcopenia was made in 60 (34.9%) patients.
Sarcopenia was associated with older age (p=0.036), lower body mass index (p=0.001), lower EMI score, with more patients included in the worst mobility category (43.3% vs 24.1%, p=0.015) and higher disability according to HAQ (p=0.017, table 1). There was no association with death.
In the multiple linear regression, sarcopenia was an independent predictor of poorer mobility. Having sarcopenia represented a score of less -2.640 points in EMI (-4.604; -0.675, p=0.009), regardless of current age, being discharged to a nursing home or having performed physical rehabilitation post hip fracture.

Table 1 - Comparative analysis of the patients with and without sarcopenia

Variables	Sarcopenia (low muscle strength and quantity**)		
	Sarcopenia N=60	No sarcopenia N=112	p-value
Age (years), mean (SD)	81 (74.5-85)	78 (73.5-83.5)	0.036*
Female, n (%)	48 (80)	91 (81.3)	0.843
Current smoker, n (%)	1 (1.7)	4 (3.6)	0.738
Alcohol consumption, n (%)	7 (12.1)	14 (12.5)	0.434
BMI, kg/m2, median (IQR)	21.3 (19.4-25.6)	27.1 (23.6-29.3)	<0.001*
Elderly mobility scale, median (IQR)	10.5 (6.8-17)	15 (8.8-18.0)	0.003*
Elderly mobility scale category, n (%)			0.015*
Good	21 (35)	63 (56.3)	
Intermedium	13 (21.7)	22 (19.6)	
Bad	26 (43.3)	27 (24.1)	
HAQ, median (IQR)	2.063 (1.563-2.531)	1.750 (0.968-2.250)	0.017*
EQ5D, median (IQR)	0.288 (0.125-0.406)	0.325 (0.288-0.657)	0.070
Previous fracture, n (%)	27 (45)	65 (59.6)	0.068
Time of the surgery after current fracture, n (%)			0.902
First 48h	42 (85.7)	83 (86.5)	
After 48h	7 (14.3)	13 (13.5)	
Physical rehabilitation after current fracture, n (%)	30 (56.6)	58 (58)	0.868
After discharge, n (%)			0.298
Home	36 (67.9)	36 (67.9)	
Nursing home	17 (32.1)	17 (40.5)	
DXA results (after fracture), n (%)			
BMD femur neck	0.729 (0.562-0.756)	0.669 (0.612-0.767)	0.389
T-Score femur neck	-2.2 (-3.550;-1.900)	-2.6 (-3.150;-1.800)	0.635
Visual acuity problems, n (%)	28 (46.7)	51 (45.5)	0.887
Audition problems, n (%)	31 (51.7)	41 (36.6)	0.055
Physical exercise, current, n (%)	29 (25.9)	9 (15)	0.101
Death, (%)	1 (1.7)	1 (0.9)	0.577

Footnote:
** low muscle strength defined as grip strength <27kg men; <16kg women; low muscle quantity defined as calf circumference <31cm and/or mid-upper arm circumference ≤28.6 cm men and ≤27.5 women). Diagnosis of sarcopenia according to EWGSOP2 definition.
*Statistically significant, p<0.05

Conclusions
The diagnosis of sarcopenia after a fragility hip fracture was associated with poorer mobility in the 6 months after the hospitalization and thus could be useful for predicting prognosis in this population.

P918

FRACTURE RISK EVALUATION IN BREAST CANCER WOMEN UNDER HORMONOTHERAPY IN A SPECIALIZED RHEUMATOLOGY-ONCOLOGY CONSULTATION

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Objectives: Breast cancer (BC) and hormonotherapy (HT) represent a risk factor for bone loss and fractures. A vigilant strategy for these women is necessary to provide a structured primary prevention of fractures. We aimed to describe bone health status and interventions in a specialized consultation.
Material and Methods: Retrospective study including consecutive women with breast cancer under HT referred to a specific Rheumatology-Oncology consultation in the last 2 years. Clinical, radiographic, and dual x-ray absorptiometry (DXA) data was collected.

Results:
A total of 100 women were evaluated. Of these, 61 had high fracture risk according to European Society for Medical Oncology (ESMO) clinical practice guidelines. Mean age was 60 (10.2) years old and 96.7% women were post-menopausal, with 21.3% presenting early menopause. Before referral, 9 (14.8%) patients had clinical fractures and 4 (6.6%) had asymptomatic vertebral fractures. Most patients (n=39, 62.9%) were under aromatase inhibitors (AI) therapy, 5 (8.2%) with tamoxifen + goserreline and 13 (21.3%) transitioned from tamoxifen to AI. The median duration of HT before referral was 4 (1-5.5) years and, additionally, 83.6% of the patients had chemotherapy and 77% radiotherapy.
DXA before starting HT was obtained in 65.6% of the patients and, during HT, 86.9% women had a DXA performed. When comparing the DXA results (before and during HT treatment), there was a significant loss of femoral neck bone mineral density (BMD) (p=0.001) and lumbar BMD (p=0.001), with a median of 3 (2-5.5) years between DXAs (table 1).
Of the 61 patients with indication for fracture prevention treatment, only 12 (19.4%) were under anti-osteoporotic treatment before referral, and treatment was started in a total of 44 women (72.1%), mainly with zoledronate 4mg (49.2%) and denosumab 60mg (19.7%), both every 6 months.

Table 1 – Comparison of dual x-ray absorptiometry (DXA) scan results before and during hormonotherapy using Wilcoxon signed-rank test (median time between DXA scan 3 (2-5.5) years)

Dual x-ray absorptiometry (DXA) scan	Before starting HT	During HT	p-value
FN T-Score	-1.3 (-2;-0.7)	-1.8 (-2.3;-1.3)	0.001*
FN BMD	0.815 (0.727-0.884)	0.776 (0.700-0.836)	0.015*
Lumbar T-Score	-2.1 (-2.6;-1.4)	-2.4 (-2.8;-2.1)	0.001*
Lumbar BMD	0.931 (0.868-1.01)	0.892 (0.837-0.917)	0.001*

Footnote: HT – hormonotherapy; FN – femoral neck; BMD – bone mineral density
*p<0.05 considered statistically significant

Conclusion:
In our center, a structured evaluation of women with BC under HT identified most as having an indication for treatment and allowed treatment to be started. Future studies evaluating the follow-up of these women is needed to reflect the treatment effect.
Acknowledgments: *these authors contributed equally to this work

P919

BONE MINERAL DENSITY AND BODY COMPOSITION IN PATIENTS WITH VARIOUS CAUSES OF CHILDHOOD GROWTH HORMONE DEFICIENCY (COGHD) AFTER COMPLETION OF GROWTH

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Introduction: Patients with COGHD represent a heterogeneous group in many respect, preferably due to different causes of this hormone deficiency. Studies are inconsistent in relation to bone mineral density (BMD) and body composition (BC) of these subjects.
Aim: To investigate the influence of the etiology of COGHD on bone mineral density and body composition of patients after completion of growth in transition period.
Patients and Methods: In a monocentric, observational, retrospective cross-sectional study, we investigated 298 COGHD patients (16-25 years old, mean age 19.1±2.5 years, 193 males) at first evaluation after transfer from pediatrics to the adult department. Sixty subjects experienced childhood-onset endocranial tumor (TUM, 20.1%). Other patients had congenital (CON, 57.8%) or idiopathic COGHD (IDI 21.2%). Cross-sectional analyisis of BC and BMD were performed in these patients.
Results: The three observed etiological groups did not differ according to body weight, body height, BMI and waist/hip ratio (p>0.05**).** TUM patients had significantly lower BMD (g/cm^2) and Z-sc at spine (P < 0.05) compared to CON and IDI subjects after the transfer to adult department. IDI patients showed **higher muscle mass (45.9±**9.4kg) compared to the CONG (40.4**±**8.1 **kg) and TUM (44±**8.0kg) groups, but not significantly (P <0.05). IDI demonstrated lower fat mass (14.4±6.8kg) compared to TUM (32.4±6.2%; 17.3±6.8kg) and CON (26.9±7.2 **%; 20.4±**9.2 **kg) groups (**P < 0.05).
Conclusion: The etiology of COGHD has been shown to be an important factor in bone mass and body composition after the end of growth in the transitional period. We have shown that patients with tumor-induced GHD have an unfavorable BC, with a susceptibility to lower BMD, and therefore a risk of bone fracture.

P920

POSTERIOR ANTEBRACHIAL CUTANEOUS NERVE (PACN) INFILTRATION FOR THE TREATMENT OF LATERAL EPICONDYLITIS A PROSPECTIVE OBSERVATIONAL STUDY

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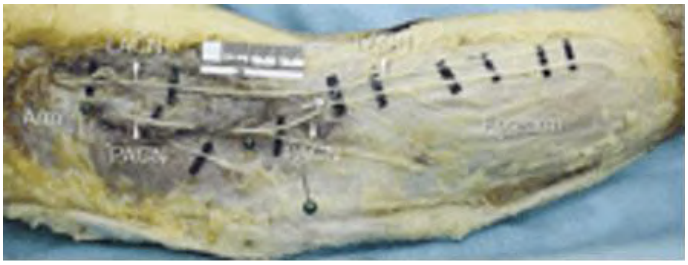
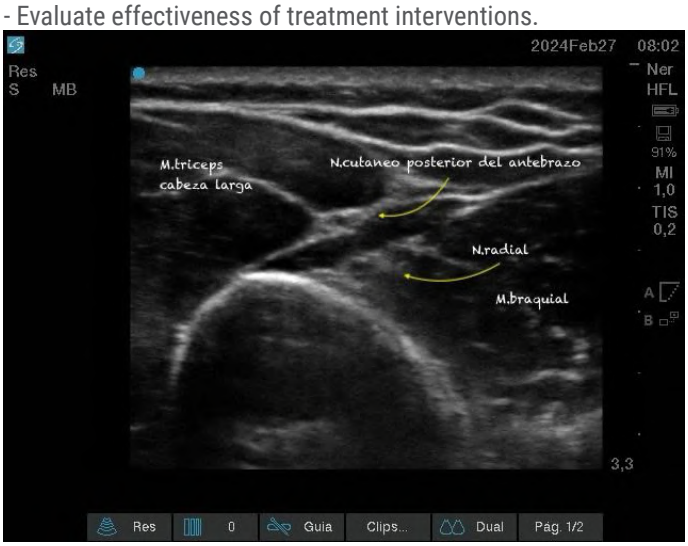
Introduction
Lateral epicondylitis (LE) is the most common cause of lateral elbow pain (incidence of 4-7 per 1000 person-years). It is common in athletes and manual workers. It often results in functional impotence, and its diagnosis is mainly clinical. The posterior antebrachial cutaneous nerve (PACN) is a sensory branch of the radial nerve that innervates the lateral epicondyle and the dorsal area of the forearm. It originates from the radial nerve distal to the spiroid fossa of the humerus and proximal to the lateral intermuscular septum. It

courses posterolaterally until it penetrates into the subcutaneous tissue to innervate the lateral epicondyle.



Objectives

Based on existing literature, we performed ultrasound-guided infiltration of the PACN in patients with clinical and physical examination compatible with LE:
- To assess the reliability of ultrasound as an imaging method to identify the nerve and guide the therapeutic intervention.
- Evaluate effectiveness of treatment interventions.



Material and Methods

We recruited 14 patients diagnosed of Lateral Epycondylitis, with VAS>4 (average-VAS: 6.9) and functional limitation.

1st visit:

- Ultrasound-guided infiltration of the PACN using bupivacaine 15 mgs and betamethasone 6mg. Effectiveness by physical examination and VAS scale at 30 min.

4th folowing up:

- VAS<4: We repeated the infiltration if reported persistent functional limitation and mild to moderate pain.
- VAS>4: We associated RFP 42º, 6min, prior to infiltration, in patients who reported persistent functional limitation and moderate to severe pain.

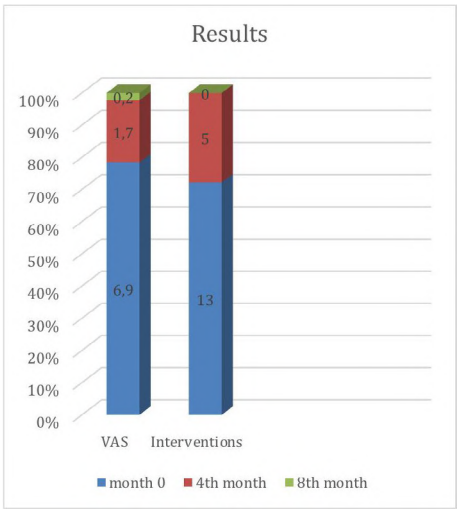
We completed the **8-month follow-up.**

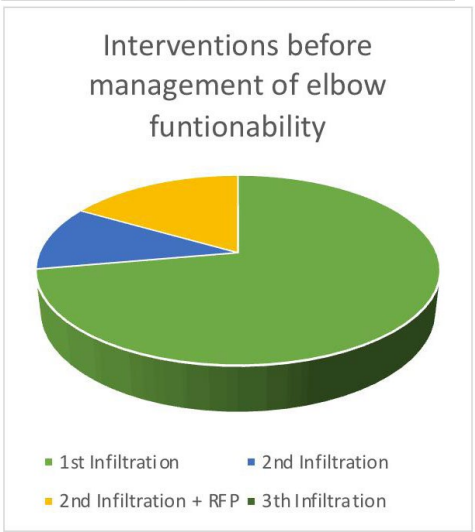
Results

Ultrasound localisation of the PACN was possible and reliable in all cases (P 5/5).

PACN blockade was effective after 30 minutes in 100% of cases (VAS 0).

Eight patients did not require further interventions, two required new infiltration at 4º months, and three patients needed RFP plus nerve infiltration.





** One patient was excluded (post-infiltration anxiety crisis).

Conclusions:

High-resolution ultrasound is useful to identify small nerves and guide perineural procedures effectively. Therapeutic procedures targeting the PACN could establish an effective line of treatment for pain secondary to LE. Further studies will be necessary to obtain more evidence in the treatment of pain secondary to LE.

Bibliography:

P921

UNCOMMON PRESENTATION OF MONOSTOTIC FEMORAL PAGET'S DISEASE

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Introduction: Paget's disease of bone (PDB) is a chronic skeletal disorder characterized by disorganized bone remodeling, leading to structural abnormalities and increased fragility. Diagnosis combines clinical, analytical, and radiographic findings. Monostotic PDB is rare (10–20%), and femoral involvement typically occurs proximally. Distal femoral involvement is atypical, often mimicking malignancy or infection. (1) Progression to sarcoma is a rare complication (<1%).

Case Description: A 70-year-old male hospitalized for subependymoma excision at neurosurgery department reported recent-onset left knee pain, leading to a rheumatology evaluation. Examination revealed firm swelling over the medial aspect of the left knee without effusion or mobility limitations, which the patient described as longstanding, without previous pain or other associated symptoms. Knee radiographs (X-Rays) showed enlargement and altered bone architecture and density of the medial femoral condyle (Figure 1A). Differential diagnosis included malignancy, osteomyelitis, and PDB. Initial laboratory results were unremarkable, including normal alkaline phosphatase (ALP). Further bone turnover markers (BTM) evaluation showed elevated levels of N-terminal telopeptide of type I collagen, C-terminal telopeptide of type I collagen and Procollagen type I N-terminal propeptide. Bone scintigraphy (BS) revealed unspecific increased osteoblastic activity in the left femur, not differentiating between PDB, infection or malignancy (Figure 1C). To program a surgical bone biopsy to a definite diagnosis, a magnetic resonance imaging (MRI) of the knee was performed, showing an intact cortical bone without suspicious lesions (Figure 1B), reducing the likelihood of malignancy or infection. A multidisciplinary team decided against risky invasive biopsy and empirically administered 5 mg intravenous zoledronic acid. The patient's pain resolved within one month. Follow-up at six months showed resolution of osteoblastic activity (Figure 2B) and improved bone architecture (Figure 2A), confirming atypical monostotic PDB.

Conclusion: This case highlights a rare and atypical presentation of long-term asymptomatic monostatic femoral PDB. The integration of various imaging modalities and biochemical markers, beyond AlP, was essential for its diagnose.

References: (1) Monostotic Paget's disease of the femur: A diagnostic challenge and an overlooked risk. J. Bachiller-Corral, C. Díaz-Miguel, A.Morales-Piga. Elsevier, Bone (2013) 57: 517–521.

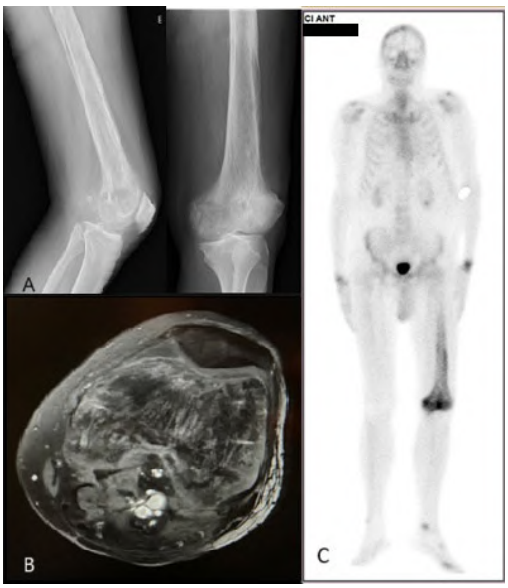

Figure 1: A- initial knee radiograph with enlargement and bone architecture alteration at left medial femoral condyle; **B** – initial knee MRI (axial T1 post-gadolinium) showing signal transformation into areas of intermediate signal with relatively regular cortical thickening and evident contrast enhancement in areas where the cortical bone is destroyed; **C** – initial entire body bone scintigraphy with moderate to intense radiotracer uptake in the distal two-thirds of the diaphysis and the distal epiphysis of the left femur.

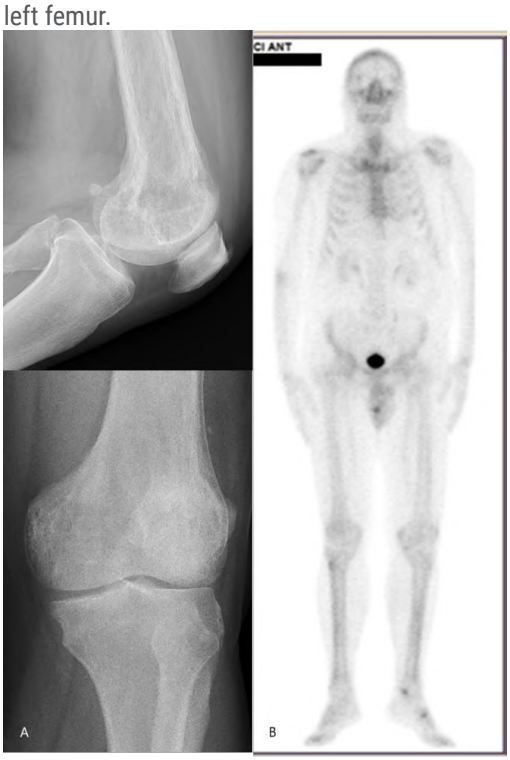

Figure 2: A - 6-month after treatment knee radiographs with improvement of bone architecture, previously deteriorated; **B** - 6-month after treatment entire body bone scintigraphy with absence of significantly increased osteoblastic activity in the left femur.

P922

THE ASSOCIATION BETWEEN FRAILTY AND MORTALITY, AND ASSOCIATED FACTORS, BIRJAND LONGITUDINAL ADULT STUDY

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Introduction: Frailty syndrome is a physiologic process characterized by declined capacities in multiple organs. It makes patients more prone to worse health outcomes. Frailty is commonly observed in older adults and is associated with decreased strength, endurance, and functional capabilities. This condition is associated with a higher risk of falls, hospitalization, disability, and mortality. Increased age, female gender, lower physical activity, and malnutrition are claimed to be associated with risks of frailty syndrome. However, there is no common consensus regarding these factors.

Methods: This study included 1364 patients who were interviewed and examined. Their related data regarding various factors, diseases, sociodemographic characteristics, and social and lifestyle habits were documented. Finally, their association with frailty and phenotype was assessed, and correlation and relative incidence risk were calculated using univariate and multivariate logistic regressions.

Results: *This study showed that* females were slightly frailer (55.73%) compared to males (44.27%). However, this difference was insignificant. Age and frailty were significantly associated ($p = 0.000$). Frailty was most common in individuals with ideal body weight (45.04%) and least common among the overweight group (28.24%). A weakly significant association between BMI categories and frailty was observed ($p = 0.040$). Higher rates of frailty were seen in illiterate individuals (64.89%) compared to those with higher education (e.g., 0.76% frail among academics). A strong association was noted between education level and frailty ($p < 0.001$). The risk of frailty was significantly higher in widowed women compared to married women ($p = 0.003$). The mortality rate was higher in the frail group (13.74%) than in the non-frail group (3.97%). A strong association between frailty and death was observed ($p = 0.000$). Logistic Regression Analysis also showed that frailty was a predictor of death. Frail individuals had significantly higher odds of mortality, with an odds ratio (OR) ranging from 2.08 to 3.85 across different models, and adding variables (e.g., sex, age, BMI, waist circumference, multimorbidity, education) incrementally showed that age was consistently a strong predictor of death (OR ~1.08–1.09).

Conclusion: Frailty is closely tied to age, education, marital status, and BMI categories. This study showed that frailty is a strong independent predictor of mortality, even after adjusting for other factors. Additionally, education level and multimorbidity significantly influence the risk of death.

P923

ASSESSMENT OF THE QUALITY OF LIFE OF GERONTOLOGICAL PATIENTS AFTER MYOCARDIAL INFARCTION

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The quality of life of elderly patients depends on many factors: on the state of health, measures of social support, the ability to optimally interact with people around.

Objective. To evaluate the quality of life of gerontological patients after a myocardial infarction according to the WHO questionnaire according to the quality of life of the population of the population of the SF-100.

Methods. The study was conducted in the department of medical rehabilitation of the city hospital from 10.02.2024 to 10.10.2024. An examination of 80 patients over 75 years old was conducted. A survey was carried out using the WHO questionnaire according to the quality of life of the SF-100. Patients signed a voluntary informed consent to participate in the study.

Results. The average age of patients was 75.9±4.9 years, in men - 74.4±5.1 years, in women 78.6 ±4.7 years. The average period after the acute myocardial infarction was 4.7±1.3 months. When assessing energy in everyday life, only 7% of respondents are fully satisfied with this indicator, 92% on the contrary experience energy (23% rarely mark the breakdown, 42% quite often, 20% very often and 7% note a significant energy deficiency). In the question "How much do you enjoy life?" Only 12% of patients gave a positive answer, while 88% of respondents do not fully enjoy life. When assessing the cognitive capabilities of 92% of patients, memory disorders are noted (14% of patients note the minimum discomfort in this regard, 45% bothers this moderately, 26% are significantly not satisfied with their memory, 7% are not fully satisfied).

The quality of sleep is not satisfied with 87% of people. When evaluating anxiety and depression, 85% of patients note the presence of poor mood, despair and depression (6% of patients note these symptoms “very often”, 11% of “often” surveyed, 42% of patients

With moderate frequency, 27% "rare"). 91% of patients feel lonely. Among issues on assessing satisfaction and their appearance, 93% of people are not satisfied.

Conclusion. The results of the study of the quality of life show a decrease in the quality of life in elderly patients. An important stage in the structure of individual programs for the restoration treatment of patients of the gerontological profile is psychological rehabilitation.

P924

ASPECTS OF THE QUALITY OF LIFE OF GERIATRIC PATIENTS

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Objective. Assessment of the quality of life of gerontological patients using the SF100 questionnaire.
Methods. The work was carried out on the basis of the city hospital from 10.01.2024 to 10.07.2024. In the examination, 70 patients over 75 years were included. A survey was carried out using the WHO questionnaire according to the quality of life of the population of the population of the SF100. All patients signed a voluntary informed consent.
Results. The average age of patients was 79.25±3.8 years, in men - 78.1±4.4 years, in women 80.4±3.2 years. 32.8% (n=23) had disability, of which the third group was 47.8% (n=11), the second group - 47.8% (n=11), the first group - 3.35% (n =1).
When assessing the physical capabilities of 95% of respondents, varying degrees of severity of movement restrictions are noted (16% minimum restrictions, 38% moderate restrictions, 32% pronounced restrictions, 9% of patients cannot move at all); 91% of patients noted the presence of restrictions in the performance of everyday tasks (22% experience minimal restrictions, 52% moderate restrictions, 17% pronounced restrictions).
To the question "How do you evaluate your ability to work?" 9% of patients noted that 14% have extremely weak performance, 45% moderate performance, 21% are good and only 11% of patients note sufficient performance.
When evaluating the pain syndrome, it was revealed that 11% of patients had no pain; In 85% - the presence of pain, while patients note rare episodes of pain (25%), frequent pain (34%), very frequent pains (33%); Chronic pain syndrome (5%).
To the question of the need for drug therapy: 75% noted the need for medication (33% of patients notes a relatively weak dependence, 24% - moderate, 18% pronounced dependence).
Conclusion. Patients over the age of 70 have low quality of life. Heriah specialists need to pay attention to this fact when organizing treatment.

P925

RHEUMATOID ARTHRITIS: FOCUS ON ASSESSING THE STATE OF SKELETAL MUSCLES AND THE SEVERITY OF PAIN SYNDROME

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Background. Pain is a leading symptom in patients with rheumatoid arthritis. In patients with rheumatoid arthritis, a decrease in muscle force, a deterioration in the function of skeletal muscles are often observed.
Objective. Purpose: to study the relationship between muscle strength and the degree of severity of pain in patients with rheumatoid arthritis.
Methods. In the study include 90 women with rheumatoid arthritis, confirmed according to the criteria of ASR/EULAR (2010). A survey of patients, an assessment of the pain syndrome of the bone-muscular system on the visual analogue scale (your Scale for Pain Assessment), the determination of the muscle strength of the lower and upper extremities using the “stand from the chair” and the cystic dynamometry of the underinative hand, respectively, were carried out. The functional state of the muscles was estimated by the speed of walking by 5 meters and the test “Stand and go”. To identify associations between the level of pain and muscle status, a single -factor logistic regression analysis was used.
Results. In the examined patients of the age of the age, it was 55.2 [52.0; 62.0] year, duration by rheumatoid arthritis - 10.0 [7.0; 13.0] years, pain on your 50 [44; 56] mm. The median of the muscle force of the under -means was 11 [7; 15] kg, and the lower extremities - 17.2 [12.6; 21.8] seconds. The reduced strength of the muscles of the upper extremities was found in 67.3% of people, and the lower extremities in 56.2% of the examined. Low muscle strength at least one of the tests was noted in 75.2% of patients. The median speed and the time of execution of the “Stand and go” test amounted to 0.9 [0.8; 1.1] m/s and 11 [9; 12] C, respectively. The functional state of the muscles was reduced in 56.7% of patients. In the course of regression analysis, it was revealed that the pain according to your > 50 mm was associated with low muscle strength and physical performance of the muscles of the lower extremities (OR 2.38 95% DI 1.23–4.65 and OR 2.70 95% DI 1.30–6.27, respectively, p<0.01).
Conclusions. The strength of the skeletal muscles was reduced in 75.2% of the examined persons, and reduced physical performance in 56.7% of patients with rheumatoid arthritis. The presence of pain in your more than 50 mm was associated with an increase in the risk of lowering muscle strength by the lower extremities by almost 2.3 times, and violations of the functional state of the skeletal muscles by 2.8 times.

P926

ASSOCIATION OF ABCG2 GENE POLYMORPHISM 421C>A (Q141K, RS2231142) WITH COLCHICINE EFFICACY

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Objective: To evaluate the efficacy of colchicine in patients with different missense genetic variants of the ABCG2 gene (Q141K; rs2231142) in gout patients.

Materials and Methods: The study included 59 gout patients aged over 18 years with serum uric acid levels >360 μmol/L who were not receiving urate-lowering or anti-inflammatory therapy. All patients were treated with colchicine at 0.5–1 mg/day and febuxostat at 80–120 mg/day. Genotyping of the ABCG2 gene polymorphism 421C>A (rs2231142) was performed. Colchicine efficacy was assessed in patients with different genotypes (CC, CA, AA) of the ABCG2 gene.

Results: Among 59 patients, 38 (64%) had the CC genotype, 18 (31%) had the CA genotype, and 3 (5%) had the AA genotype. The impact of different ABCG2 genotypes (rs2231142) on the frequency of arthritis flares and their intensity was assessed in patients with CC (n = 38) and CA/AA (n = 21) genotypes (Table 1). The analysis revealed no significant influence of genotype on the frequency or intensity of arthritis flares (p > 0.05 in all cases).

Table 1 — The Impact of Different Genotypes of the ABCG2 Gene (rs2231142) on the Frequency and Intensity of Arthritis Flares in Patients with CC (n = 38) and CA/AA (n = 21) Genotypes

Parameter	Genotype CC (n = 38)	Genotype CA/AA (n =21)	p
Total number of flares during the observation period, Me [25th; 75th percentile]	0 [0; 1]	1 [0; 1]	0,5
Number of flares during months 0 to 3 of observation, Me [25th; 75th percentile]	0 [0; 1]	0 [0; 1]	0,6
Number of flares during months 3 to 6 of observation, Me [25th; 75th percentile]	0 [0; 0]	0 [0; 0]	0,9
Pain intensity on the Visual Analog Scale (VAS) during months 0 to 3, mm (M ± SD)	53,8±17	51,8±24,6	0,8
Pain intensity on the Visual Analog Scale (VAS) during months 3 to 6, mm (M ± SD)	54±16,3	64,6±13,3	0,2
Pain intensity on the Visual Analog Scale (VAS) over the entire observation period, mm (M ± SD)	56,8±17,2	57,3±22,9	0,9

Conclusion: The presence of different genotypes of the ABCG2 gene (Q141K; rs2231142) does not influence colchicine efficacy regarding the frequency or intensity of arthritis flares.

P927

COMPARISON OF EFFICACY AND SAFETY OF DIFFERENT COLCHICINE DOSES IN PATIENTS WITH GOUT

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To compare the efficacy and safety of long-term administration of different doses of colchicine (0.5 mg/day vs 1.0 mg/day) for the prevention of arthritis flares during the initial months of xanthine oxidase inhibitor therapy.

Materials and Methods:

The study included 96 patients diagnosed with gout (ACR/EULAR 2015 criteria). Patients were randomized into three groups using fixed randomization:

Group 1: Colchicine 0.5 mg/day and febuxostat 80 mg/day.

Group 2: Colchicine 1.0 mg/day and febuxostat 80 mg/day.

Group 3: Febuxostat 80 mg/day (without colchicine).

The observation period lasted six months. The following outcomes were compared: frequency of arthritis flares, intensity of pain (assessed using the Visual Analog Scale, VAS) during flares, and incidence of adverse events (AEs).

Results: The relative risk (RR) of arthritis flares in patients receiving colchicine 0.5 mg/day compared to those not receiving anti-inflammatory therapy was 0.61 (95% CI 0.39–0.95, p=0.02). For colchicine 1.0 mg/day, the RR was 0.44 (95% CI 0.25–0.76, p=0.001). No significant differences in odds ratios (OR) were observed between the groups receiving colchicine 0.5 mg/day and 1.0 mg/day (OR 1.40, 95% CI 0.73–2.67, p=0.3).

The frequency of arthritis flares was comparable between the colchicine 0.5 mg/day and 1.0 mg/day groups (p=0.6), as was the number of patients who did not experience flares (18 [56%] vs. 22 [69%], p=0.3). In the group not receiving colchicine, only 9 patients (28%) did not develop arthritis flares (p=0.02 compared to 0.5 mg/day group; p=0.001 compared to 1.0 mg/day group).

Patients receiving colchicine 1.0 mg/day (but not 0.5 mg/day) reported significantly lower pain intensity on the VAS during arthritis flares compared to the group without therapy (p=0.04). The incidence of adverse events was comparable across all groups.

Conclusion: Long-term use of low-dose colchicine is fully justified, with 0.5 mg/day being equally effective as 1.0 mg/day in preventing arthritis flares. Moreover, the risk of adverse events is minimal for both colchicine doses (0.5 mg/day and 1.0 mg/day) in patients with gout.

P928

ASSOCIATION OF SERUM URIC ACID LEVELS WITH BONE MINERAL DENSITY IN PATIENTS WITH GOUT

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The interplay between gout, serum uric acid (sUA) levels, and bone health, particularly bone mineral density (BMD), remains insufficiently studied.

Objective To evaluate the association between sUA levels and BMD in patients with confirmed gout.

Materials and Methods The study included 73 patients who underwent dual-energy X-ray absorptiometry (DXA) of the lumbar spine and proximal femur. Among them, 14 individuals (19.1%) were younger than 40 years, for whom the Z-score was determined, and 59 individuals (80.9%) were older than 40 years, for whom the T-score was calculated. Data on various biochemical parameters were collected, including serum vitamin D levels, with a median value of 21.7 ng/mL [17.8; 26.6].

Results Of the participants, 91.7% were male, with a mean age of 49.1 ± 10.3 years. The mean sUA level was 493.5 ± 80.6 μmol/L. No significant correlations were found between sUA levels and BMD in the femoral neck or proximal femur (r=0.008; p=0.94 and r=0.02; p=0.86, respectively). A moderate correlation was identified between sUA levels and the T-score in the lumbar spine (r=0.36; p=0.036), and a weak positive correlation between sUA levels and BMD in the lumbar spine (r=0.207; p=0.078). No correlations were observed between serum calcium levels or age and BMD.

Conclusions No association was found between sUA levels and the Z-score in any of the analyzed regions. However, a moderate association with the T-score in the lumbar spine was identified.

P929

ORTHO-GERIATRIC SERVICE ACROSS EUROPEAN COUNTRIES

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Introduction:
Ortho-geriatrics is a recognised geriatric services/subspecialty in Europe with different models of care. However, there is significant variation in the development of this service across the continent, with some countries offering a well-developed service and others having little or no service. This survey collected data from European countries on the type and frequency of orthogeriatric services provided, as part of a broader survey examining the different geriatric medicine services provided.

Methods:
We asked board members of the European Union of Medical Specialities-Geriatric Medicine Section to fill in a cross-sectional survey about the existence and frequency of orthogeriatric services (as part of a broader survey) in their countries. The questionnaire categorised service availability from institutions into four levels– No(none), Yes-Minority(<25%), Yes-Some(25%-75%) or Yes-Majority(>75%).

Results:
We received responses from 39 countries, which we categorized into four geographical regions: Nordic(NORD;n=5), Central-Western Europe(CWE;n=9), Eastern Europe(EE;n=17), Southern Europe(SE;n=8). We found a significant variation in the availability of services between countries. More services were provided in the NORD (73%) and CWE (77%) regions. In contrast, orthogeriatric services were lacking in EE (only 14%) and SE (42%). Overall, 26 (66%) countries reported having some orthogeriatric services, although only 9 countries (23%) had this service in the majority (>75%) of hospitals.

Discussion:
This is the first comprehensive survey of provision of orthogeriatric services across Europe and shows wide discrepancy between the 4 regions of Europe. The data gathered will be valuable for discussions with policy makers in developing orthogeriatric services in their countries.

P930

ARTIFICIAL INTELLIGENCE-BASED RADIOMICS ON OPPORTUNISTIC COMPUTED TOMOGRAPHY FOR PREDICTING VERTEBRAL FRACTURES IN WOMEN WITH BREAST CANCER UNDER HORMONE-DEPRIVATION THERAPIES

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Introduction: women under estrogen-deprivation therapies (HDTs) for breast cancer are at high fracture risk, but currently available fracture prediction tools are imprecise. Emerging evidence suggests that radiomics may contribute to fracture risk assessment in general population, but its application in this context is unknown.

Objective: To identify radiomic features (RFs) on opportunistic computed tomography (CT) associated with vertebral fractures (VFs) in women under HDTs, and to develop a radiomics-based model predictive of VFs. Methods: Radiomics analyses were performed on CT scans of 109 women (median age 61.1 years, range 27-85) exposed to HDTs (median 27.1 months). Lumbar vertebrae were automatically segmented (convolutional neural network) for RFs extraction. Each feature was tested for its ability to predict VFs. Patients were randomly divided into training and test co-

horts for the development and validation of the predictive model. **Results:** Morphometric VFs were diagnosed in 23 women (21.1%), in association with older age (P=0.013), lower total hip T-score (P=0.041) and higher FRAX score for major fractures (P=0.045). The machine-learning model based on 20 RFs showed a high ability to predict VFs (ROC 0.832), outperforming that of T-score and FRAX score, even when lower thresholds than conventional ones were used (ROC 0.77 and 0.45, respectively). The RF "information measure of correlation" was the most relevant feature in the model, suggesting that a reduction in texture cross-correlation is positively associated with the development of VFs (p<0.001). **Conclusions:** The radiomics-based machine learning model showed high potential in identifying women at high fracture risk during HDTs.

P931

GENERAL POPULATION AWARENESS ABOUT OSTEOPOROSIS AND 10-YEAR FRACTURE RISK

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The aim of the study was to assess the level of awareness about osteoporosis (OP) among men and women who applied for a preventive check—up, to identify key risk factors and determine the 10—year risk of fractures.

Methods: A cross-sectional anonymous survey enrolled 80 respondents (56 women and 24 men), aged 26 to 71, who applied for a routine general practitioner check-up during November 2024. Each respondent filled out the "One—Minute Osteoporosis Risk Test" questionnaire developed by the International Osteoporosis Foundation (IOF), a screening tool designed to pre-assess risk factors for osteoporosis. To assess the risk of fractures, the FRAX® tool was used to assess 10—year risk of fractures in respondents over the age of 50. All patients had not been examined before and had not received treatment for osteoporosis.

Results and discussion. The average age of the respondents was 47.7±11.0. Mean BMI was 26.0±6.1 kg/cm^2. The sampling was stratified by age. The Group 1 consisted of 48 persons aged from 26 to 49 (mean 40.4±6.1) average body mass index 24.4±5.3. Group 2 included 32 respondents aged 50 and over (mean 58.6±7.0), average body mass index was 28.5±6.5.9.

General level of awareness about OP was significantly higher in the younger group than in Group 2: 41.2% vs 34.4% respectively. This may indicate a higher level of awareness among young people about the risks of osteoporosis, possibly due to greater attention to health issues, especially in the context of disease prevention. The greatest difficulties among the respondents were caused by issues related to the first symptoms of the disease, family history, frequency of occurrence among different gender groups, as well as issues of treatment and prevention. In our study, 37.7% of women and 29.7% of men among the younger age group answered positively to questions on the family history of OP. In the older age group, the awareness about family history of OP and fractures was significantly lower: 21.9%. Every third respondent was able to give answers about possible early symptoms of osteoporosis (for example, pain) that may occur before the fractures diagnosis. It is noteworthy that the majority of respondents (58.8%) could not answer the question about prevention measures and treatment of OP. Vitamin D3 deficiency prophylaxis was reported as 37.5% in Group 1 versus 21.9% in Group 2. Also, there were 49.7% respondents with sufficient physical activity in Group 1 versus 31.2% persons in Group 2.

The data obtained confirm that the level of physical activity decreases with age, which, in turn, may contribute to the risk of OP. A survey of respondents on such harmful habits as smoking and alcohol consumption showed that among all the respondents, the proportion of smokers was 57.5%, mostly men, which confirms the importance of preventive measures to reduce smoking, especially among men. Also, 10.0% of women reported alcohol consumption within the acceptable range against 28.8% males.

FRAX® assessment in Group 2 revealed 9 persons of moderate risk of fractures and 5 subjects of high 10-year risk of fractures. 6 women had a history of low energy traumatic fractures, men had no history of fractures. All 6 women who had a low-traumatic fracture, had a history of smoking for many years, 3 of the them had a history of parental hip fracture, another one had been taking glucocorticoids for years.

Conclusions. The overall level of awareness about the problem of osteoporosis among the respondents was 37.9%. The greatest difficulties were noted when answering questions about the first symptoms of the disease, the prevalence of osteoporosis among different gender groups, as well as methods of OP treatment and prevention. Thus, it is necessary to enforce efforts to increase the level of general population awareness about OP preventive measures. FRAX® scale should be implicated into preventive health check-ups in 50 and over aged persons to identify individuals with a high 10—year risk of fractures for further prevention of low-energy fractures.

P932

10 YEARS FOLLOW UP FOR TREATMENT OF OSTEOARTHRITIS OF THE FIRST CARPOMETACARPAL JOINT WITH EXCISION OF THE TRAPEZIUM

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Osteoarthritis of the first carpometacarpal joint is a common condition mostly affecting middle-aged women. The advanced stages and the severe form often require surgery. Numerous surgical procedures are used, but there is still no consensus on the best procedure for any given patient. Excision of the trapezium was introduced in 1949 by Gervis and has been commonly used. There are many reports favoring this procedure, and there are reports that indicate slow postoperative rehabilitation, decreased thumb length , unstable thumb , diminished grip and pinch strength. We have been using this procedure for 20 years now.

Objective: We report our postoperative results at 10 year fol-

low-up on 15 hands.
Material and methods: 15 hands (12 F, 3 M), average age at operation 57 years (47-61). All patients were right handed. 10 operations were done on the right thumb and 5 on the left. All patients were reviewed by the authors. At 10- year follow-up, all patients underwent physical and radiographic examination and were graded into excellent, good, fair and poor groups.
Results: There was dramatic relief of pain following the procedure in all patients and this has remained for the entire follow-up period. 7 patients had excellent results (46,6%), 5 good result (33,3%), and 3 (20%) a fair result, with no patient having a poor result. On the operated side the mean pinch strength was 84% of the non-operated side and the mean grip strength was 79%.
We conclude that simple excision of the trapezium is a satisfactory procedure for the majority of these patients. Early mobilization of the thumb maintains the adequate web space and thumb abduction, which in turn seems to maintain the grip and pinch strength with some diminishment. Postoperative rehabilitation may be long, but our results show that this procedure gives durable results and there is high level of patient satisfaction.
Key words: osteoarthritis of the thumb, trapezium, trapeziectomy, surgery for osteoarthritis.

P933

SERUM PROTEOMICS UNVEILS NOVEL PATHWAYS OF ALTERED BONE METABOLISM IN METABOLIC SYNDROME AND TYPE 2 DIABETES

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OBJECTIVES
Type 2 Diabetes Mellitus (T2D) is associated with low bone turnover and bone fragility despite normal-high BMD. T2D frequently coexists with Metabolic Syndrome (MetS), characterized by central obesity, dyslipidemia, hypertension, and impaired fasting glucose. We previously reported that MetS and T2D progressively decrease bone turnover while increasing BMD, though underlying mechanisms remain unclear. This study aimed to explore regulatory pathways of altered bone metabolism in MetS and T2D using a proteomic approach.
METHODS
Serum proteomic profiles were assessed by Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS) in age-matched men and women with MetS (59±5 yrs; n=26), MetS-T2D (60±5 yrs; n=26), and healthy controls (Ctr; 60±5 yrs; n=26). Data were analyzed with Spectronaut (Biognosys) and R-based bioinformatics tools.
RESULTS
Of 541 analyzed proteins, 56 were dysregulated between MetS and Ctr, 75 between MetS-T2D and Ctr, and 26 between MetS-T2D and MetS. Among them, PEDF (Pigment epithelium derived factor) was significantly upregulated in MetS and MetS-T2D vs Ctr (+6%; +23%; p<0.05) and correlated positively with HbA1c (r=0.3; p<0.01), lumbar spine BMD (r=0.2; p<0.05), hip BMD (r=0.4; p<0.01), and negatively with CTX (r=-0.4; p<0.01). IGFBP2 (Insulin like growth factor binding protein 2) was downregulated in MetS and MetS-T2D (-42%; -54%; p<0.0001) and correlated negatively with HbA1c (r=-0.4; p<0.001) and hip BMD (r=-0.3; p<0.01), but positively with OCN, P1NP, and CTX (r=0.3; p<0.05). Gene ontology enrichment analysis highlighted pathways related to lipid transport, cholesterol metabolism, inflammation, and extra cellular matrix (ECM) degradation, with several proteins correlated to bone parameters. Among them, LBP (Lipopolysaccharide binding protein) was upregulated in MetS and MetS-T2D vs Ctr (+30%; +41%; p<0.05) and correlated positively with HbA1c (r=0.3; p<0.05) and negatively with P1NP (r=-0.3; p<0.05). CRP (C reactive protein) was upregulated in MetS and MetS-T2D vs Ctr (+137%; +194%; p<0.05) and negatively correlated with P1NP and CTX (r=-0.22; p<0.05). Moreover, MMP-9 (Matrix metalloproteinase 9), a key ECM-degrading enzyme, was upregulated in MetS and MetS-T2D vs Ctr (+78%; +56%; p<0.05) and negatively correlated with OCN, P1NP, and CTX (r=-0.3; p<0.05).
CONCLUSION
Overall, this proteomic analysis delineates new potential mechanisms of low bone turnover and/or higher BMD in MetS and T2D. They include both systemic and bone-derived proteins related to osteoblastic functions (PEDF, IGFBP2), lipids transport (LBP), as well as inflammation (CRP) and ECM degradation (MMP-9), thereby potentially contributing to diabetic bone fragility.

P934

INTEGRATION OF REHABILITATION AND THERAPY IN PATIENTS WITH OSTEOPOROTIC FRACTURES: A CASE REPORT

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Introduction: Osteoporosis is a major public health concern due to its association with increased risk of fractures, reduced mobility, and higher mortality rates. Rehabilitation plays a crucial role in improving outcomes in patients with osteoporotic fractures, complementing pharmacological therapy to restore function and quality of life.
Objective: This case report aims to demonstrate the effectiveness of an individualized rehabilitation program integrated with pharmacological treatment in a patient with an osteoporotic fracture.
Case Description: We present the case of a 72-year-old female patient with a history of osteoporosis and a low-energy distal radius fracture. Initial management included fracture stabilization and initiation of anti-osteoporotic medication (bisphosphonates and calcium/vitamin D supplementation). A personalized rehabilitation program was developed, focusing on progressive strength training, balance exercises, and functional mobility. Rehabilitation sessions were conducted daily over a 3-week period under multi-

disciplinary supervision.
Results: The patient showed significant improvement in grip strength (+35%), range of motion in the wrist (measured with a goniometer: flexion improved by 20°, extension by 25°, and pronation/supination by 15° each), and pain reduction (VAS score decreased from 6 to 2). Functional independence was restored, as evidenced by resumption of daily activities without assistance. The combined approach highlighted the synergy between pharmacological and rehabilitation strategies.
Conclusion: This case underscores the importance of a multidisciplinary approach in managing osteoporotic fractures. Tailored rehabilitation, combined with medical therapy, optimizes functional recovery and enhances the overall quality of life in patients with osteoporosis.

P935

SCIENTOMETRIC INSIGHTS INTO THE RELATIONSHIP BETWEEN AIR POLLUTANTS AND BONE HEALTH

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Objective: Previous studies have shown a link between air pollutants and bone health in the general population. This study aims to conduct a scientometric analysis of the scientific literature on the association between air pollutants and bone health in the elderly population.
Material and Methods: We carried out a bibliometric study with a comprehensive search of the Scopus database up to 16 Jan 2025. After excluding unrelated papers, we extracted bibliometric metrics such as publication trends, productive countries and institutions, active researchers, key journals, and popular research topics, from the remaining papers using Scopus's "analyze results", and "citation reports" tools, along with VOSviewer 1.6.20.
Results: Out of 1749 records, 47 studies were relevant to this topic. A trend of increasing publications was observed, with the highest number in 2024 (n=8, 17.02%). The majority of the papers were original articles (n=39, 82.98%). The top three productive countries were China (n=16, 34.04%), the US (n=7, 14.89%), and the UK (n=4, 8.51%). Most of the papers published in “Osteoporosis International” (n=5, 10.64%), "Journal of Clinical Endocrinology and Metabolism" (n=3, 6.38%), and “International Journal of Environmental Research and Public Health” (n=2, 4.25%). The total citation number of these 47 articles was 1767. The most cited paper (676 citations) was a review article titled “Environmental factors that influence the cutaneous production of vitamin D ", published in “American Journal of Clinical Nutrition ". The top three affiliations producing these documents were all based in China: “Ministry of Education of the People's Republic of China”, (n=6, 12.76%), “Tibet University” (n=3, 6.38%), and “Kunming Medical University” (n=3, 6.38%). The leading subject areas were medicine (n=38, 80.85%), and environmental science (n=12, 25.53%). The top authors were “Guo, B.” and “Zhao, X”, each with three publications, all from China. Out of the 113 keywords, the most frequent were "air pollution", "osteoporosis", "bone mineral density" and "particulate matter".
Conclusions: This study highlights the growing body of research on the link between air pollution and bone health, with China as the leading contributor and *“Osteoporosis International”* as a key journal for influential publications. However, further research in this area is essential.

P936

VITAMIN D AND K STATUS IN POSTMENOPAUSAL WOMEN WITH NORMAL AND LOW BONE MINERAL DENSITY

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Objectives: Deficiencies of vitamin D and K are believed to promote bone loss, osteoporosis and osteoporotic fractures, but existing evidence is controversial. Functional vitamin D deficiency is characterized by a low vitamin D metabolite profile, accelerated bone metabolism and increased mortality. Vitamin K, a cofactor of γ-glutamylcarboxylase, modulates bone metabolism through post-translational conversion of glutamate residues in osteocalcin (OCN) and matrix-Gla-protein (MGA). At present, data regarding the relationship between multiple metabolites of both vitamins and BMD are scarce. Therefore, this study aimed to measure several metabolites of both vitamins by liquid chromatography tandem mass spectrometry (LC-MS/MS) in a cohort of postmenopausal women with low and normal bone mineral density (BMD).
Methods: Vitamin metabolites (25-hydroxyvitamin D (25[OH] D), 24,25-dihydroxyvitamin D (24,25$(OH)_2$D), phylloquinone (K1), menaquinone-4 (MK-4) and MK-7) were measured in 131 serum samples by LC-MS/MS. The vitamin D metabolite ratio (VMR) was calculated. Parathyroid hormone (PTH), type I procollagen-N-terminal-peptide (PINP) and C-terminal telopeptides of type I collagen (CTX-I) were measured by immunoassay. Dual X-ray absorptiometry was performed to identify participants with normal (T-score>-1) and low (T-score<-1) BMD.
Results: Mean age was 58.2±8.5 years. BMD was normal in 68 and low in 63 women. Median (interquartile range) for 25(OH)D and total vitamin K concentrations were 53.5 (39.6-65.9) nmol/L and 1.33 (0.99-2.39) nmol/L. All vitamin metabolites were comparable in individuals with normal and low BMD. Furthermore, BMD and trabecular bone score were comparable in participants

with adequate and inadequate vitamin status (at least one criterion was met: 25(OH)D <50 nmol/L, $24,25(OH)_2D$ <3 nmol/L, VMR <4 %, total vitamin K <0.91 nmol/L). PTH, but not PINP or CTX-I, was inversely correlated with 25(OH)D, $24,25(OH)_2D$ and VMR. Synergistic effects between vitamin D and K were not observed.
Conclusions: Vitamin D and K status is not related to BMD and trabecular bone quality in postmenopausal women. Inverse associations were only seen between vitamin D metabolites and PTH.

P938

FAMILIAL ALKAPTONURIA: DIAGNOSTIC CHALLENGES AND VARIABILITY IN LATE-ONSET MANIFESTATIONS—A CASE SERIES OF THREE SIBLINGS

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Introduction Alkaptonuria, a rare autosomal recessive metabolic disorder caused by a deficiency of homogentisic acid oxidase, results in the systemic deposition of homogentisic acid. We describe three members of a consanguineous family affected by this hereditary condition, showcasing the diverse clinical presentations and delayed diagnoses typical of the disease.
Case Reports
Case 1: A 66-year-old woman presented with progressive lower back stiffness, restricted hip and shoulder movement, and a limp. Examination revealed bluish discoloration of the ear cartilage, sclera, and nails. Imaging identified lumbar disc calcifications, extensive spinal osteophytes, severe bilateral hip osteoarthritis, and advanced shoulder arthropathy. The clinical and radiological findings confirmed the diagnosis. The patient's history revealed a sister with similar mobility issues, prompting her evaluation.
Case 2: A 62-year-old woman, the elder sister, had bilateral hip pain with limited movement and scleral hyperpigmentation. Observation of urine darkening under light exposure confirmed alkaptonuria. Radiographs showed severe hip arthropathy requiring total hip replacement. The family history revealed a brother with childhood episodes of darkened urine, leading to his investigation.
Case 3: The 50-year-old brother was asymptomatic but was found to have characteristic lumbar spine calcifications on imaging. Despite the absence of rheumatologic symptoms, the radiological findings established the diagnosis of alkaptonuria.
Discussion
This familial cluster highlights variability in the clinical spectrum of alkaptonuria. While the sisters developed disabling ochronotic arthropathy, the brother remained asymptomatic into middle age. Ochronosis often manifests with musculoskeletal symptoms later in life, complicating early diagnosis. Initial signs, such as urine discoloration, are frequently overlooked. Characteristic pigmentation provides a critical diagnostic clue, but advanced structural damage can occur insidiously, as seen in this series. Despite the availability of supportive care, no curative treatment exists.
Conclusion
This case series emphasizes the unpredictable nature of alkaptonuria within familial contexts, demonstrating significant variations in clinical presentation and progression. Early recognition through clinical signs, radiological features, and genetic testing is essential for timely intervention. Enhanced awareness of this rare disorder is crucial to prevent delayed diagnoses and mitigate the impact of advanced ochronotic arthropathy.

P939

COMPARISON OF RADIOLOGY AUGMENTED VS ASYNCHRONOUS OF ARTIFICIAL INTELLIGENCE (AI) ENABLED VERTEBRAL FRACTURE (VF) REPORTING

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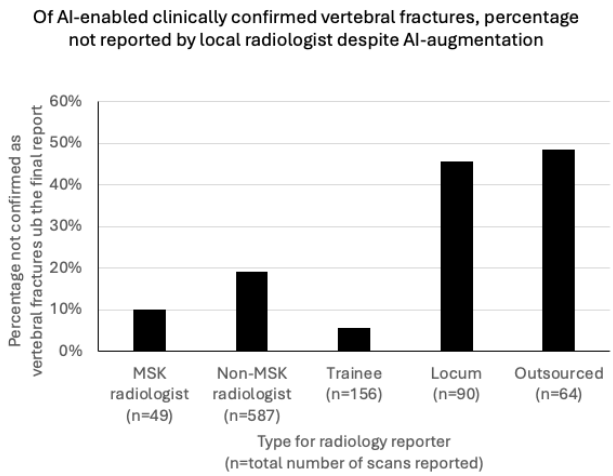
Objectives:
To compare the performance of using synchronous AI-augmented general radiology reporting with asynchronous dedicated MSK expert review of CT scans flagged by AI.
Material and Methods:
Using the Nanox-AI HealthVCF AI model, CT scans that included the thoracic or lumbar spine were re-analysed at a high specificity setting to identify those with potential moderate or severe vertebral fractures. If the AI flagged a potential vertebral fracture, the CT images were annotated for the reporting radiologist to confirm, and the patient be referred to the Fracture Liaison Service (FLS). In addition, all AI-flagged CT scans were sent to a separate server for asynchronous reading by a musculoskeletal (MSK) radiologist. We used Fisher's exact test to compare the number of vertebral fractures referred to the FLS from the two pathways.
Results
Between December 2023 and November 2024, 10,679 scans were analysed, with 1,311 flagged by the AI as potential vertebral fractures. An MSK radiologist confirmed 946 (72.2%) as vertebral fractures. Non-MSK radiologists reported 62% of scans. Overall, 20.9% of scans with at least one confirmed vertebral fracture were not reported and referred. Trainees had the lowest missing rate, with the highest missing rate being for outsourced and locums radiologists ($p<0.001$) (Figure). The commonest non-MSK speciality was gastroenterology (24% of all scans), with a missing rate of 18.2%. The highest non-MSK missing rates were from Chest/Nuclear Medicine (29.6%), head&neck (26.7%) and Breast (26.3%).
Conclusion
Even with AI-informed prompting, a fifth of scans with confirmed VF were not reported. This supports asynchronous reading of the AI-flagged scans and should inform local implementation.



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Disclosures
Connor: Honoraria: Amgen, Thornton & Ross, UCB
Javaid: Grants: UCB, Kyowa Kirin; Honoraria: UCB, Amgen, Kyowa Kirin, Nanox-AI, Naitive Technologies, Theramex, Thornton-Ross
Threlkeld: Honoraria: UCB

P940

IMPACT OF AI-ENABLED VERTEBRAL FRACTURE (VF) IDENTIFICATION ON FRACTURE LIAISON SERVICE (FLS) KEY PERFORMANCE INDICATORS (KPIS) AND TREATMENT RECOMMENDATIONS VARIES BY FLS

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Objectives:

To compare the KPIs of FLSs before and after the introduction of AI-enabled VF identification across FLSs in England and Wales.

Materials and Methods:

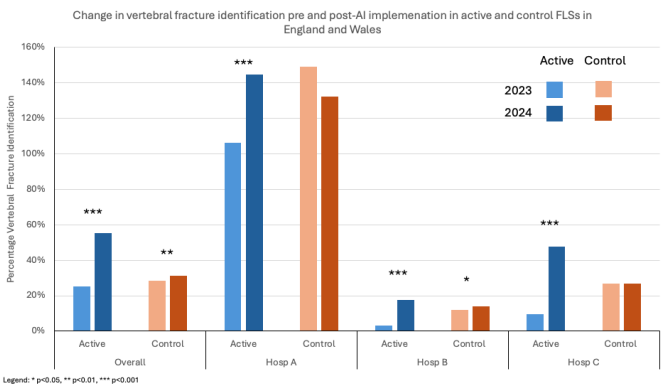
The Nanox-AI HealthVCF AI model was implemented in 3 FLSs to identify potential vertebral fractures from existing CT scans with additional funding for FLS administrators and nurses. The KPIs for identification, assessment, treatment recommendation and follow-up were compared before (Jan to Nov 2023) and after (Jan to Nov 2024) AI implementation using the FLS-Database of England and Wales. Each AI-FLS was supported to deliver patient-co-produced Quality Improvement (QI). Up to 4 control FLSs for each AI-FLS were identified, matching on spine fracture identification KPI in 2023 to account for secular changes. Differences in proportions were compared using two-proportion z-tests.

Results

While overall VF identification doubled from 25.1% (2023) to 55.4% (2024), p<0.001, there were marked differences between AI-sites (Figure). Non-AI Control sites demonstrated a smaller increment in VF identification from 28.6 to 31.3% (p=0.007) which was inconsistent across sites. The change in KPI for VF patients varied by AI-FLS. Time to assessment significantly worsened in Hosp B and C but remained stable in Hosp A. DXA within 12 weeks worsened in Hosp B (85.7% to 66.7%) and Hosp C (92.3% to 80.6%) with little change in Hosp A (96.8 to 94.9%). The proportion of patients who were recommended treatment remained unchanged except for Hosp C, where it worsened from 85.2 to 71.4% (p=0.01).
For non-vertebral fracture (NVF) patients in AI-FLSs, time to assessment worsened in Hosp A & C (p<0.03) but improved in Hosp B. DXA within 12 weeks did not significantly change except for Hosp C where it improved (91.9% to 96.6%, p=0.02). The treatment recommendation rate for NVF significantly improved in Hosp B and C (p<0.003) and was unchanged in Hosp A.

Conclusion

As expected, AI implementation significantly improved VF identification but had differential effects on the KPI for VF and NVF between the AI-FLSs despite a focus on QI. These findings highlight the importance of enhancing QI when implementing AI-enabled VF identification in the FLS setting.



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Baxter: Honoraria: Nuffield Health
Boylan:Honoraria: UCB
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Connor: Honoraria: Amgen, Thornton & Ross, UCB
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Pinedo: Honoraria: UCB, Mereo
Sahota: Honoraria: UCB, Pharmacos
Threlkeld: Honoraria: UCB
Turton: Honoraria: Amgen, Lily; Grant: Amgen

P941

DELIVERING ROMOSOZUMAB FOR HIGH FRACTURE RISK PATIENTS IN THE FRACTURE LIAISON SERVICE (FLS) SETTING: SERVICE MODIFICATIONS AND EARLY RESULTS

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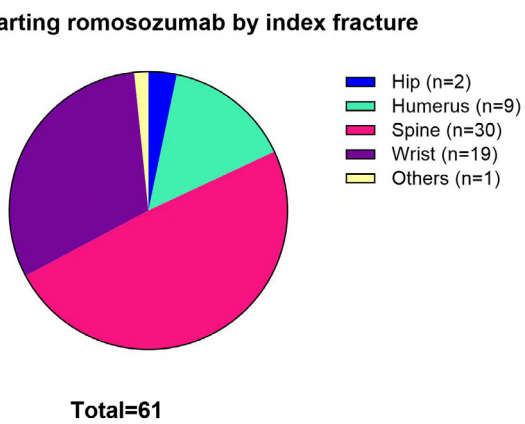
Objective The UK guidelines recommend first line romosozumab (Romo) for postmenopausal people with a recent hip, vertebral, humerus or wrist fracture and a BMD T-score ≤-3.5 or T-score ≤-2.5 with a vertebral fracture within 24 months, a history of ≥2 osteoporotic vertebral fractures, or a very high FRAX-based fracture risk. These patients are routinely seen by FLS where anabolic treatment usually requires referral to the specialist bone clinic.

Methods A patient co-developed, multidisciplinary team (MDT) identified changes to the FLS pathway to enable access to Romo: Fractures below the knee were excluded, and spine fracture detection enhanced by standardising referral from positive VFA and AI analyses of existing CT scans. All patients without a history of cardiovascular disease were automatically referred for DXA and completed a questionnaire including QRISK3. If eligible by DXA, patients were sent lab tests (including HbA1c, non-fasting lipids) and the Royal Osteoporosis Society Romo leaflet before their FLS Nurse telemed assessment. Eligible cases were reviewed in weekly MDT meetings with the clinical lead. Treatment was initiated using homecare providers.

Results From 01/2024 to 09/2024, the FLS identified a total of 1705 postmenopausal women with newly diagnosed fractures, including major osteoporotic fractures of the hip (n=361), humerus (n=193), spine (n=376), or wrist (n=232). After clinical assessment, Romo was started in 61 patients (3.6%). Almost half of these patients had a vertebral fracture (n=30) and nearly a third a wrist fracture (n=19, Figure 1). The median time from first fracture to treatment recommendation was 147 (IQR 104-194) days and from fracture to Romo initiation was 170 (IQR 119-209) days.

Conclusion
Integrating Romo into the FLS setting required a pathway redesign for patient identification, assessment, treatment recommendation and monitoring. Further work is required to assess clinical and patient experience and satisfaction.

Figure 1



P942

ORAL HYGIENE IN SPONDYLOARTHRITIS: UNVEILING KNOWLEDGE GAPS AND OPPORTUNITIES FOR PREVENTION

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Introduction: Periodontal disease has been linked to various chronic systemic diseases, including chronic inflammatory rheumatic diseases. Some studies hypothesize that in genetically predisposed individuals, periodontal pathogens may trigger a response responsible for the development of spondyloarthritis (SpA). These findings have heightened interest in the oral hygiene habits of patients with SpA.
Objectives: To evaluate the knowledge and habits of patients with SpA regarding oral hygiene.
Methods: A prospective descriptive study was conducted, including patients diagnosed with SpA according to the ASAS 2009 criteria. Demographic data, SpA-related information, and treatment details were collected. Oral hygiene practices were assessed using a questionnaire.
Results: Thirty-six patients with SpA were included. The mean age was 42.6±12.5 years, with a male predominance (70%). The mean disease duration was 12.4±3.5 years. Seventeen patients (47.2%) were active smokers, and 5 (16.6%) consumed alcohol.

The mean BASDAI was 4.5±2.3, and the mean BASFI was 4.6±2.2. Regarding oral complaints, dental pain was reported by 30.5% (11 patients), gingival bleeding during brushing by 22.2% (8 patients), and tooth mobility by 2.7% (1 patient). For daily oral hygiene, 83.3% of patients brushed their teeth regularly. Among them, 58.3% (21 patients) brushed once per day, and 8.3% (3 patients) brushed twice daily. Most patients brushed for two minutes in 50% (18 patients) of cases, while 38.8% (14 patients) did not pay attention to brushing duration. The use of dental floss and mouthwash was observed in only 8.3% (3 patients) and 16.6% (6 patients), respectively.
Regarding toothbrush replacement, 38.8% (14 patients) replaced their toothbrush every 2 months, while 25% (9 patients) did so every 3 months or more. The last dental visit occurred within 3 months for 27.7% (10 patients), between 3 and 6 months for 41.6% (15 patients), and over 1 year ago for one-third of patients (11 patients).
Statistical analysis revealed that poor oral hygiene practices were significantly associated with active smoking (p=0.02) and higher BASDAI scores (p=0.03). Patients with gingival bleeding during brushing had significantly longer disease duration (p=0.04). Additionally, irregular dental visits were associated with higher pain scores on the VAS scale (p=0.01).
Conclusion:
The level of knowledge regarding oral hygiene among patients with spondyloarthritis appears to be insufficient. These findings highlight the importance of prevention and awareness programs focused on oral hygiene. Strengthened collaboration between rheumatologists and oral healthcare professionals could help mitigate the potential impact of periodontal factors and improve the overall management of these patients.

P943

LONG-TERM OUTCOMES OF DENOSUMAB THERAPY IN SACRAL ANEURYSMAL BONE CYST: A 7 YEAR FOLLOW-UP CASE REPORT

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Background: Aneurysmal bone cysts (ABCs) are rare, benign, but locally aggressive bone lesions that can present significant therapeutic challenges, particularly in anatomically complex regions such as the sacrum. While surgical resection and radiotherapy remain standard treatment options, alternative approaches are warranted in cases where these interventions pose high risks. Denosumab, a monoclonal antibody targeting RANKL, is approved for the treatment of giant cell tumors of bone (GCTBs) and has shown potential benefits in ABCs due to their similar pathophysiology, characterized by osteoclast-mediated bone resorption.

Case report: An 18-year-old female diagnosed with a sacral ABC was initiated on denosumab therapy in April 2016 due to the high surgical risk associated with the lesion's location. Treatment followed the standard GCTB protocol, with an initial loading dose of 120 mg subcutaneously weekly for 4 weeks, followed by monthly injections for a total duration of 12 months. The patient experienced complete pain resolution early in the treatment course. Follow-up MRI scans at 6 and 11 months demonstrated significant new bone formation and lesion stabilization. At the 7-year follow-up, the patient remains asymptomatic, with stable imaging findings and no recurrence. No adverse effects, including hypocalcemia or osteonecrosis, have been observed, and the patient continues regular vitamin D supplementation as part of ongoing bone health management.

Conclusion: This case highlights the long-term efficacy and safety of denosumab in the management of sacral ABCs. The treatment provided sustained symptomatic relief and radiological stability without complications. Denosumab represents a promising therapeutic alternative in cases where surgery is not feasible, with appropriate metabolic monitoring and bone health support.

Keywords: aneurysmal bone cyst, denosumab, sacral lesion, bone health, long-term follow-up, RANKL inhibition.

P944

LONG-TERM BISPHOSPHONATE THERAPY AND MEDICATION-RELATED OSTEONECROSIS OF THE JAW (MRONJ): A CASE REPORT

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Introduction: Bisphosphonates are widely used in the treatment of osteoporosis due to their effectiveness in reducing fracture risk. However, long-term use has been associated with rare but serious complications, including medication-related osteonecrosis of the jaw (MRONJ). This case highlights the importance of regular monitoring and careful evaluation of prolonged bisphosphonate therapy, especially in cases where treatment duration extends beyond recommended guidelines.
Case Report: A 1943-born female patient with a 27-year history of bisphosphonate therapy for osteoporosis, which was inadvertently continued beyond the recommended duration, presented with swelling and pain in the right submandibular region. Initial imaging revealed a suspected abscess, and the patient underwent incision and drainage, followed by antibiotic therapy. Despite initial improvement, subsequent imaging confirmed the presence of MRONJ, although no significant radiological signs were observed at the onset of symptoms.
Further imaging showed minor sclerosis in the mandibular region, prompting discontinuation of bisphosphonates. Antibiotic therapy was administered, and hyperbaric oxygen therapy was recommended. An endocrinological reassessment led to the discontinuation of bisphosphonates, along with the introduction of vitamin D supplementation and dietary recommendations for calcium-rich foods to support osteoporosis management.
Conclusion: This case underscores the need for cautious long-term prescribing of bisphosphonates and the importance of early recognition and multidisciplinary management of potential

complications such as MRONJ. Regular follow-ups and reassessments are crucial to optimizing osteoporosis treatment while minimizing adverse effects.

P945

FAMILIAL HYPERCALCIURIC HYPERCALCAEMIA (FHH) AND OSTEOPOROSIS IN A PATIENT TREATED WITH CINACALCET AND ZOLEDRONIC ACID

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[1]Bone Health Unit, Mercer's Institute for Successful Ageing, St James's Hospital, Dublin, Ireland, [2]Mater Miscericordiae University Hospital, Dublin, Ireland

Introduction: Familial hypocalciuric hypercalcaemia (FHH) is a rare autosomal dominant condition. The majority of cases results from a mutation in the Calcium Sensing Receptor (CSAR). This shifts the set point higher for serum calcium giving rise to mild hypercalcaemia and a high or non-suppressed serum parathyroid hormone (PTH). While FHH is not associated with bone loss it may co-exist with osteoporosis, cause symptomatic hypercalcaemia and be mistaken for primary hyperparathyroidism. We report the case of a female with FHH, symptomatic hypercalcaemia and osteoporosis that was treated with cinacalcet and zoledronic acid.

Case: A 54-year-old lady with osteoporosis (lowest T-score -2.5), intolerant of oral bisphosphonates, was referred to our clinic. Medical history included FHH (CSAR mutation positive) diagnosed at age 36 presenting with mild hypercalcaemia (serum calcium 2.85 mmol/l) and a non-suppressed serum PTH (45 pg/ml). There was no immediate family history so primary hyperparathyroidism was initially suspected. However, 24-hour urinary calcium was low (1.5 mmol) and genetic testing confirmed FHH. She also had a childhood diagnosis of cyclic neutropenia (ELA gene positive) with recurrent sepsis, until treated with G-CSF. G-CSF was the only potential risk factor for osteoporosis apart from being menopausal. Given her intolerance of oral bisphosphonates, she was started on zoledronic acid. At clinic, she complained of dehydration and polyuria for over one year and had persistent hypercalcaemia (2.84mmol/l). Four weeks after starting cinacalcet her serum calcium decreased to 2.60 mmol/l, remained lower at 3 months (2.56 mmol/l) and was associated with improved symptoms

Discussion: FHH is rare and may co-exist with osteoporosis though can be mistaken for primary hyperparathyroidism. Importantly, even without a family history the diagnosis should be considered, as 5-10% may result from de novo mutations. Symptomatic hypercalcaemia is rare in FHH but can respond to cinacalcet, though case reports are limited, and long-term data is lacking. G-CSF appears to be associated with bone loss though more studies are needed to further explore this.

P946

HIGHER SERUM URATE ASSOCIATED WITH INCREASED RISK OF HIP FRACTURE INDEPENDENT OF BONE MINERAL DENSITY

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Objective: Serum urate is associated with higher bone mineral density (BMD) but the relationship with fracture is more complex and conflicting. Some studies have identified an increased risk of hip fracture with increasing serum urate and in patients with gout. We aimed to explore the relationship between serum urate and hip fracture in patients attending our bone health clinic.

Material and methods: We identified patients attending our bone health clinic with a history of hip fracture who had serum urate levels measured. The relationship between urate and hip fracture was explored in multinomial regression adjusting for age, sex, renal function (eGFR), body mass index, serum 25(OH)D, parathyroid hormone, and total hip BMD.

Results: There were 1600 patients of whom 70% were female, mean age 70.0 years. Compared to those in the lowest quartile of urate, those in both the highest and third highest quartile had an increased risk of hip fracture (p=0.001). This remained significant after adjusting for hip BMD with a respective increased risk in the highest quartile (OR 2.17, CI 1.36 – 3.47, p=0.001) and third highest quartile (OR 1.68, CI 1.08 – 2.62, p=0.020).

Conclusion: Serum urate positively predicted hip fracture independent of BMD. This suggests that any increased fracture risk may be mediated by negative effects on bone quality. Limitations were that we were not able to account for thiazide diuretics and confounding factor such as diabetes or a diagnosis of gout. Further studies are required to elucidate on the complex relationship between serum urate and bone health.

P947

EXTERNAL VALIDATION OF A DEEP-LEARNING BASED OSTEOPOROSIS SCREENING METHOD USING CHEST FRONTAL RADIOGRAPH - A SINGLE CENTER, RETROSPECTIVE STUDY

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Objective: This study aims to externally validate the performance of a deep-learning model for screening osteoporosis using frontal chest radiographs.

Materials and Methods: We retrospectively included individuals (age ≥ 50yrs) who visited Yangji Hospital in Seoul, South Korea, from June 2023 to June 2024, and underwent both a chest posteroanterior radiograph (CXR) and a DXA scan on the same date. For AI analysis, we used commercially available AI software (CXR:OSTEO, Promedius Inc.), which analyses CXR to produce a confidence score (0–1). Based on this score, the individuals are clas-

sified as either high or low risk for osteoporosis. We assessed the model's performance by using the bone mineral density (BMD) category from DXA T-scores as the reference standard. Subgroup analysis was conducted based on age or sex. Also, the model's AUC was compared with that of calcaneal quantitative ultrasound (QUS).

Results: Among the 500 subjects (76.4% female; mean age, 63.3 years), 100 individuals had osteoporosis, while 400 did not. The model demonstrated an AUC of 0.866 (95% CI: 0.827–0.905). Using the pre-defined threshold 0.5 for binary classification, the sensitivity, specificity, PPV, and NPV were 77.0%, 80.3%, 49.4%, and 93.3%, respectively. In the sex-based subgroup analysis, the model achieved AUCs of 0.87 and 0.80 for female and male subjects, respectively. The AUC ranged from 0.82 to 0.91 among different age groups. Compared with QUS, the model's AUC of 0.866 was higher than the previously reported QUS AUCs (0.66–0.766).

Conclusion(s): The deep-learning model demonstrated robust performance in identifying individuals with osteoporosis from CXRs during external validation. This highlights its potential as a screening tool for osteoporosis, utilizing CXRs, the most widely used imaging modality worldwide.

Disclosures

J.Song, S.Park, M.Kim - employee of Promedius Inc.
H.Bae - Board member and shareholder of Promedius Inc.
J.Kim - principal investigator of the study

P948

ADVANCING OPPORTUNISTIC SCREENING OF STRATIFIED BONE MINERAL DENSITY DISORDERS USING DEEP LEARNING ON CHEST X-RAY

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Objective:
Bone mineral density (BMD) disorders, including osteoporosis and its osteopenia subtypes (mild, moderate, advanced), are highly prevalent conditions that significantly increase the risk of fractures if left undiagnosed or untreated. While Dual-Energy X-ray Absorptiometry (DXA) remains the gold standard for BMD assessment, its high cost and limited accessibility hinder its use in opportunistic screening. This study aims to develop a deep learning model leveraging chest X-rays (CXRs) to classify BMD into normal BMD or osteoporosis categories and further stratify osteopenia into specific subtypes. By enabling precise and early detection, this approach seeks to enhance bone health management through cost-effective and scalable solutions.
Materials and Methods:
We retrospectively collected 69,201 CXR images and corresponding DXA scans from a single tertiary care hospital in South Korea. BMD was categorized using DXA T-scores into normal BMD (≥ -1.0), mild osteopenia (-1.0 to -1.49), moderate osteopenia (-1.5 to -1.99), advanced osteopenia (-2.0 to -2.49), and osteoporosis (≤ -2.5). The dataset was split into 80% for training the deep learning model and 20% for internal validation. For external validation, an additional 3,338 chest X-ray images were acquired from an external institution to evaluate the model's generalizability. We developed a cascaded deep learning architecture that first classifies each chest X-ray as normal BMD, osteopenia, or osteoporosis, and then further stratifies osteopenia cases into mild, moderate, and advanced subtypes. Model performance was assessed using the area under the receiver operating characteristic curve (AUC) to ensure accurate classification and stratification of BMD disorders.
Results:
For internal validation, the model achieved AUC scores of 0.934, 0.947, 0.738, 0.804, and 0.867 for normal BMD, osteoporosis, and osteopenia subtypes (mild, moderate, advanced), respectively. Similarly, during external validation, the model demonstrated consistent performance, achieving AUC scores of 0.868 for normal BMD, 0.899 for osteoporosis, and 0.652, 0.754, and 0.819 for osteopenia subtypes.
Conclusion:
The deep learning model effectively classifies BMD into normal BMD, osteoporosis, and stratifies osteopenia into mild, moderate, and advanced subtypes using CXRs. This detailed stratification enables targeted interventions and early prevention of osteoporosis progression, improving patient outcomes and optimizing healthcare resources through scalable and efficient bone health monitoring.

P949

THE IMPACT OF SARCOPENIA RISK ON FUNCTIONAL AND NUTRITIONAL STATUS IN OLDER ADULTS UNDERGOING JOINT REPLACEMENT SURGERY FOR OSTEOARTHRITIS

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Objective
Osteoarthritis (OA) and sarcopenia are two common musculoskeletal disorders frequently observed in older adults. Understanding and addressing the interplay between OA and sarcopenia is crucial in managing musculoskeletal health in older adults.
Material and Methods
Patients 65 years and older with OA who were hospitalized for joint replacement surgery in orthopedic surgery ward underwent comprehensive geriatric assessment (CGA). Patients were grouped into two according to their sarcopenia risk status that was determined with SARC-F score and groups were compared in terms of individual CGA components.
Results
A total of 82 patients were consecutively included in the analysis. Of the study sample, mean age was 72.90 and 68.29 % was women. Two groups were similar regarding their mean age and

sex distribution. Whereas patients with a SARC-F score of 4 or more and thus at high risk of sarcopenia were observed to be more dependent in both basic and instrumental activities of daily living (ADL) according to their Katz ADL and Lawton-Brody IADL scores, respectively. Moreover, high-sarcopenia risk group carried a higher malnutrition risk with lower Mini Nutritional Assessment short form scores and more prone to frailty having higher frailty scores with Clinical Frailty Scale.

	High Sarcopenia Risk SARC-F≥4 n=45	SARC-F<4 n=37	*P*
Age	73.51 (SD:4.67)	72.16 (SD:4.53)	0.19
Sex (female)	34 (75.55%)	22 (59.45%)	0.11
Katz ADL	5 (IQR:1)	6 (IQR:1)	**0.003**
Lawton-Brody IADL	7 (IQR:2)	8 (IQR:0)	**<0.001**
CFS	5 (IQR:1)	4 (IQR:1)	**<0.001**
GDS	3 (IQR:5.5)	1(IQR:3)	**0.011**
MNA-sf	10.5 (IQR:1.25)	12.0 (IQR:1)	**0.001**
Vitamin B12	245 (IQR:175.5)	290 (IQR:154.5)	0.27
Ferritin	97.0 (IQR:81)	86.5 (IQR:72.25)	0.31
25-OH Vitamin D	13.5 (IQR:12.25)	17 (IQR:15.5)	0.09

Conclusion

Patients with OA who are at high risk for sarcopenia demonstrated greater dependency in daily living activities, higher malnutrition risk, and increased frailty levels. These findings underscore the importance of integrating sarcopenia screening and targeted interventions into the management and rehabilitation of older adults with osteoarthritis to improve functional outcomes and overall health.

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TRABECULAR BONE SCORE AND BACK PAIN IN WOMEN WITH RHEUMATOID ARTHRITIS

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Objective: to assess the bone microarchitecture using the trabecular bone score (TBS) and its association with back pain in women with rheumatoid arthritis (RA)

Material and methods: 128 women with a confirmed RA were divided into two groups: I - 100 people (mean age 58.8±11.9 years) with back pain according to VAS ≥40 mm, II - 28 persons (mean age 57.8±10.6 years) with back pain according to VAS <40 mm. All patients underwent questionnaires, dual-energy X-ray absorptiometry (DXA) of the lumbar spine (Lunar Prodigy Advance, USA). The bone microarchitecture was assessed depending on the TBS level: degraded - TBS ≤ 1.23, partially degraded – TBS 1.23 - <1.31, normal microarchitecture - TBS ≥ 1.31. Lateral vertebra assessment (LVA) was performed. The study was approved by the local ethics committee.

Results: Low TBS was detected in 29%, partially degraded microarchitecture in 20% and normal microarchitecture in 51% of the examined patients. In group I, the median TBS was 1.31 [1.21; 1.40], and in group II - 1.32 [1.22; 1.43], p>0.05. Low TBS was observed in 28% of patients in group I and in 32% in group II (p>0.05). In group I, vertebral fractures (VF) were diagnosed in 14 (14%) individuals, and in group II – in 1 (3.6%) patient (p>0.05). Among patients with VF, the mean level of back pain was 69.1 [49.5; 77.5] mm, and in women without fractures - 30.5 [20.0; 50.0] mm, p<0.05. Low TBS was significantly more common in patients with VF, and normal bone microarchitecture - in patients without VF (p<0.05).

Conclusion: Degraded bone microarchitecture was found in 29% of patients with RA. No association was observed between the TBS and the severity of back pain. Significant differences in back pain were found in patients with VF compared to those without them. Low TBS was significantly more common in patients with VF than in patients without them.

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ASSOCIATION OF TRABECULAR BONE SCORE WITH CLINICAL AND LABORATORY PARAMETERS IN WOMEN WITH RHEUMATOID ARTHRITIS

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Objective: to establish the frequency of damaged bone microarchitecture according to trabecular bone score (TBS) and to evaluate the relationship with biochemical parameters in women with rheumatoid arthritis (RA).

Material and methods: 193 women with a confirmed RA (mean age 60.7±9.9 years) were included. Questionnaires, laboratory examination (determination of erythrocyte sedimentation rate (ESR), glucose, total cholesterol, uric acid, creatinine, total protein, parathyroid hormone (PTH), albumin, alkaline phosphatase (ALP), calcium and phosphorus levels); dual-energy X-ray absorptiometry (DXA) of the lumbar spine were performed. TBS calculation of was done using TBS Insight software, version 3.0. The study was approved by the local ethics committee.

Results: According to TBS data, microarchitecture was normal in 87 (45.1%) women, partially degraded in 48 (21.9%), and degraded in 58 (30%) individuals. Negative associations were found between TBS and age (r=-0.36, p<0.0001), duration of postmenopausal period (r=-0.17, p<0.05), PTH level (r=-0.29, p<0.05), ALP level(r=-0.21, p<0.05), as well as a positive association with phosphorus level (r=0.27, p<0.05). No associations with other biochemical parameters were found. Univariate linear regression analysis confirmed the relationship between TBS and age (β = -0.36, p < 0.0001), duration of postmenopausal period (β = -0.17, p < 0.05), PTH (β = -0.30, p < 0.05), ALP (β = -0.21, p < 0.05) and phosphorus (β = 0.27, p < 0.05) levels in women with RA.

Conclusion. Bone microarchitecture as measured by TBS was inversely associated with age, duration of postmenopausal period, PTH and ALP levels, and directly associated with phosphorus levels.

P952

PREVALENCE OF CLINICAL MANIFESTATIONS AMONG HYPOPHOSPHATASIA SUBJECTS IN CENTRAL AND EASTERN EUROPEAN COUNTRIES

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Introduction: Hypophosphatasia (HPP) is a rare, life-threatening, progressive, systemic, congenital metabolic disorder caused by a "loss-of-function" mutation in the *ALPL* gene, which encodes tissue-nonspecific alkaline phosphatase (TN-ALP). HPP is a multi-organ disease, with its hallmark feature being impaired bone mineralization.
Aim: The objective of this study was to evaluate the prevalence of HPP in the Central and Eastern European (CEE) region and to assess the frequency of its clinical manifestations, including skeletal, joint, neurological, and renal symptoms.
Patients and Methods: A cross-sectional study was conducted on 49 patients with genetically confirmed HPP. Detailed clinical information was available for 34 patients from five CEE countries.
Results: The analyzed cohort consisted of 14 males and 20 females, with a mean age of 51 years. Among these, 10 patients presented with the pediatric form of HPP, while 18 were diagnosed with adult-onset HPP. A total of 33 patients (92%) exhibited TN-ALP levels below the reference range. Only one patient received treatment with asfotase alfa. Chronic pain was reported by 25 patients (69%), while tooth loss, fractures, and bone deformities were observed in 9, 15, and 6 patients, respectively. One patient had a bone mineral density (BMD) in the osteoporotic range, and three patients had a trabecular bone score (TBS) ≤1.23. Other clinical manifestations included calcifying periarthritis (7 patients), seizures (3), nephrocalcinosis (3), hypercalcemia (3), kidney stones (2), ectopic calcifications (1), and pseudogout (1). Notably, 24 patients (71%) reported the regular use of at least four analgesics.
Conclusion: This study, based on one of the largest reported cohorts of HPP patients highlights that chronic pain is the most prevalent symptom, often necessitating the use of multiple analgesics. Bone-related complications, such as fractures and deformities, and joint-related conditions, particularly calcifying periarthritis, are also frequent. These findings emphasize the need for greater awareness of HPP, along with dedicated research efforts to enhance patient care and improve access to effective treatments.

P953

GLOBAL BURDEN AND MANAGEMENT OF HYPOPHOSPHATAEMIC OSTEOMALACIA: AN IOF SURVEY

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Objectives: This study aimed to explore the burden and management of hypophosphataemic osteomalacia (HO).

Materials and Methods: A survey was developed consisting of seven general questions about respondents and their experiences of treating patients with HO, and a second section inviting non-identifying information on up to five patients with HO. The survey was disseminated to the International Osteoporosis Foundation (IOF) network.
Results: Forty clinicians from 24 countries participated, with most based in academic medical centres. Respondents reported managing over 1,000 patients with HO, primarily diagnosed with X-linked hypophosphataemia (XLH; 35%), tumour-induced osteomalacia (TIO; 24%) and fibrous dysplasia/McCune–Albright syndrome (FD/MAS; 16%). Management patterns varied by diagnosis, with XLH and TIO primarily managed by endocrinologists, while FD/MAS was more often managed by rheumatologists. Respondents provided additional information on 19 patients with XLH, 28 with TIO and 9 cases of other types of HO. Common symptoms across XLH and TIO included bone pain (XLH: 67%, TIO: 88%), muscle pain (XLH: 61%, TIO: 76%) and muscle weakness (XLH: 61%, TIO: 88%). Many patients with XLH had discontinued phosphate and vitamin D therapies, with a subset starting burosumab. In contrast, phosphate and vitamin D therapies were commonly used for patients with TIO, and many were being considered for tumour resection, with limited use of burosumab. Pain medication use, including opiates, was relatively high across all patients.
Conclusions: Awareness of XLH and TIO was particularly high among respondents, indicating strong global interest from bone specialists. Patients with XLH and TIO continue to experience troublesome musculoskeletal symptoms. To enhance patient outcomes, it's essential to educate healthcare professionals worldwide on XLH and TIO, along with management approaches.
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ENTERODIOL AND ENTEROLACTONE INHIBIT RANKL-INDUCED OSTEOCLASTOGENESIS BY REGULATING PGC-1B/ERR□ MEDIATED MITOCHONDRIAL BIOGENESIS

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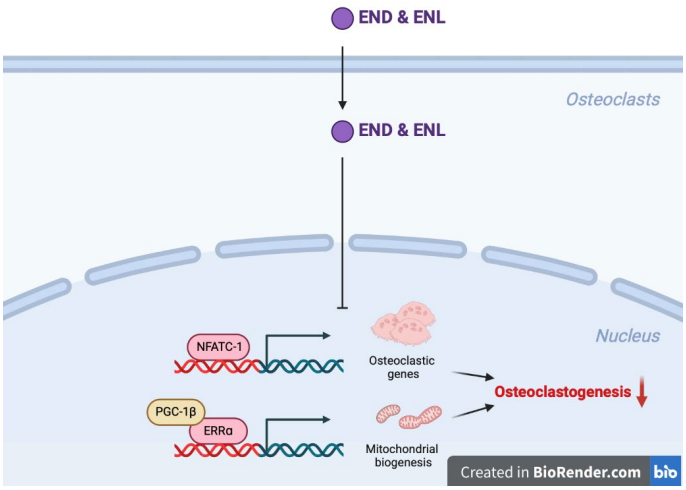

Objective(s)

Osteoporosis (OP) is the most common bone disease in the elderly and postmenopausal women. OP occurs when the rate of bone resorption exceeds the rate of bone formation, leading to decreased bone density and increased risk of fractures. Osteoclasts are specialized cells responsible for bone resorption, a highly energy-demanding process. Receptor activator of nuclear factor-κB ligand (RANKL)-induced osteoclastogenesis results in increases in mitochondria size and number, several factors related to mitochondrial biogenesis and functions, such as peroxisome proliferator activated receptor-gamma coactivator-1β (PGC-1β) and estrogen-related receptor α (ERRα) have been shown to play a fundamental role in mitochondrial biogenesis and osteoclast differentiation. Thus, focusing on osteoclast metabolic shifts could be a key for the treatment of osteolytic diseases including OP.

Enterodiol (END) and enterolactone (ENL) are plant-based polyphenolic compounds digested in the colon by bacteria. Both END and ENL have been reported have antioxidant and estrogen-like physiological regulatory functions. However, previous studies have not clearly elucidated the mechanisms by which END and ENL protect bone, particularly their roles in regulating osteoclast differentiation and function, which require further investigation.

Material and Methods

Tartrate-resistant acid phosphatase (TRAP) staining, F-actin ring staining and bone resorption assay were performed to evaluate the inhibitory effects of END and ENL on RANKL-induced osteoclastogenesis in macrophage cell line RAW 264.7 and mouse bone marrow-derived mononuclear cells (BMMs). RNA-seq was employed to identify the differential genes by END and ENL. The molecular mechanism of END and ENL were investigated by quantitative reverse transcription polymerase chain reaction (RT-qPCR), and western blot.

Results

100 μM END and ENL significantly inhibit osteoclast differentiation, F-actin ring formation and bone resorption from both RAW 264.7 cells and BMMs. Treatment with 100 μM END and ENL reduced the expression levels of differentiation markers Integrin-β3, MMP-9, Cathepsin K, NFATc-1 and c-FOS. 100 μM END and ENL suppress PGC-1β/ERRα-dependent mitochondrial biogenesis in osteoclastogenesis.

Conclusion

In summary, our findings demonstrated that END and ENL may influence osteoclast differentiation and function by regulating mitochondrial energy metabolism, offer new therapeutic reagents for preventing OP.

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RADIATION-INDUCED ACCELERATED AGING IN BREAST CANCER SURVIVORS: A PROSPECTIVE COHORT STUDY PROTOCOL

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Objective: Radiotherapy (RT) in breast cancer (BC) survivors is suggested to accelerate aging by close interrelationships between cancer, anti-cancer RT, and induced aging mechanisms. This study aims to develop a large prospective cohort to compare the incidence of accelerated aging outcomes between BC survivors treated with RT and cancer-free controls.

Materials and Methods: The cohort will include BC women survivors treated with RT and age-matched cancer-free women controls. BC survivors will be recruited from Belgian oncology clinics, while controls will be identified through referrals, advertisements, and negative mammogram screenings. Data collection involves (i) baseline and follow-up evaluations (1, 3, and 5 years) including but not limited to comprehensive geriatric assessments to diagnose sarcopenia, frailty, osteoporosis and physical function using validated tools (Dual X-ray absorptiometry, strength dynamometer, Short Physical Performance Battery test, FRAX tool) (ii) cancer and treatment data (BC survivors) including detailed records of BC subtype, stage, radiotherapy protocol (e.g., dose, fractionation, irradiated field, total dose to critical structures, site-specific dose reconstruction) (iii) data linkage with the Belgian Cancer Registry and StatBel (Belgian statistics office) for long-term follow-up of aging clinical manifestations and survival outcomes. The study will be conducted at CHU-UCL-Namur (Namur, Belgium), Cliniques Universitaires Saint-Luc (Brussels, Belgium), and poten-

tially extended to other Belgian centers (CHU-Liège, Jules Bordet Institute). It hypothesizes that BC survivors treated with RT will present earlier and higher incidence of aging-related outcomes, including sarcopenia, osteoporosis, and frailty, compared to cancer-free controls and the general population. Advanced statistical methods will be applied, such as Fine-Gray competing risk models and linear mixed models for internal group comparisons (BC survivors vs. cancer-free controls) and standardized incidence ratio/excess relative risks for external comparisons with Belgian reference registries (BC survivors vs. Belgian reference population).
Results: Not applicable
Conclusion: This study protocol hypothesizes that RT for BC may trigger accelerated aging in survivors. Early identification of this aging process could enable personalized RT protocols, preventive aging interventions during BC survivors' supportive care, and the development of novel therapeutic targets addressing aging-related endpoints.

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ROMOSOZUMAB IN SWEDEN – A REGISTRY STUDY ON OSTEOPOROSIS PATIENTS

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Objectives: Romosozumab (Romo) was approved for treatment of severe osteoporosis (OP) for postmenopausal women at high risk of fracture in the European Union in December 2019; since July 2020, it has been reimbursed in Sweden for postmenopausal women with OP and vertebral or hip fracture within the last year. This is the first study to characterise Romotreated patients in Sweden.
Material and Methods: We conducted a retrospective cohort study utilising data from patient and prescription registries in Sweden. Included patients were females aged ≥50 receiving OP medication from July 2020 to August 2024. The study included three patient cohorts that: i) were treated with Romo (cohort 1); ii) had OP-related fractures within the last two years but were treated with other OP medications (cohort 2), and iii) had no OP-related fractures within two years prior to initiating other OP treatments (cohort 3). Index date was defined as the first dispensation of Romo or other OP treatment after the date that Romo was reimbursed in Sweden. The baseline period was the five years prior to index. Baseline patient characteristics were compared between cohorts using chisquared (categorical) or Wilcoxon signed-rank tests (continuous).
Results: Overall, 132,945 patients were included; patient characteristics are shown in the **Table**. Patients treated with Romo (cohort 1) were generally younger and had lower prevalence of comorbidities and glucocorticoid use than cohorts 2 and 3. Of 1,114 patients treated with Romo, 76.9% did not receive any prior community or outpatient pharmacydispensed OP treatment, compared with 65.1% and 48.0% in cohorts 2 and 3, respectively. In the past year, cohort 1 had lower hip fracture incidence compared with cohort 2 (9.0% vs. 22.8%, p<0.001), and modestly greater spine (27.8% vs. 17.7%, p<0.001) and nonhip nonspine (50.5% vs. 39.1%, p<0.001) fracture incidence.
Conclusions: This study offers insight into the patterns of Romo use in clinical practice in Sweden. The available data suggest that over three-quarters of patients who received Romo had not received prior OP treatment, suggesting that first use of osteoanabolic agents in the treatment sequence of OP is largely being followed.
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Estelle Bajtner: Employee and stockholder of UCB.
Tanja Kaarill: Employee of UCB.
Helena Skröder: Employee of Quantify Research, a contract research organisation that provides consultancy services to the pharmaceutical industry.
Johan Liseth Hansen: Employee of Quantify Research, a contract research organisation that provides consultancy services to the pharmaceutical industry.
Christina Andersson: Employee and stockholder of UCB.
Alireza Moayyeri: Employee and stockholder of UCB.

Table. Patient characteristics at index.

	Patients treated with romosozumab (cohort 1)[a] (N=1,114)	Patients treated with other OP medications (cohort 2)[a] (N=27,779)	Patients treated with other OP medications (cohort 3)[a] (N=104,053)
		Patients with OP-related fractures within the last two years	Patients without OP-related fractures within the last two years
Age at index, mean ± SD	70.1 ± 8.2	77.4 ± 10.1	74.6 ± 9.5
Index treatment, n (%)			
Oral bisphosphonates[c]	0 (0)	19,259 (69.3)	84,633 (81.3)
Zoledronate	0 (0)	1,060 (3.8)	3,524 (3.4)
Denosumab	0 (0)	6,309 (22.7)	14,958 (14.4)
Teriparatide	0 (0)	1,051 (3.8)	493 (0.5)
Raloxifene	0 (0)	49 (0.2)	365 (0.4)
Ostrogen	0 (0)	49 (0.2)	1 (<0.01)
Romosozumab	1,114 (100)	0 (0)	0 (0)
OP treatment history,[d] n (%)			
Oral bisphosphonates[c]	203 (18.2)	8,014 (28.9)	47,042 (46.1)
Zoledronate	10 (0.9)	259 (0.9)	1,280 (1.2)
Denosumab	36 (3.2)	1,906 (7.2)	7,892 (7.6)
Teriparatide	74 (7.6)	511 (1.1)	383 (0.3)
Raloxifene	2 (0.2)	90 (0.3)	439 (0.4)
Ostrogen	4 (0.4)	24 (0.1)	9 (0.01)
Romosozumab	0 (0)	0 (0)	0 (0)
OP treatment naive	857 (76.9)	18,086 (65.1)	49,042 (48.0)
Total Charlson-Quan comorbidity index, mean ± SD	0.9 ± 1.1	1.3 ± 1.9	1.2 ± 2.0
Prevalence of comorbidities, n (%)			
Cardiovascular disease[e]	12 (1.1)	2,632 (9.5)	9,502 (9.1)
Diabetes[f]	48 (4.3)	3,233 (11.6)	8,936 (8.6)
Malignancy	81 (7.3)	2,610 (9.4)	13,030 (12.5)
Chronic pulmonary disease[g]	76 (6.8)	3,945 (14.2)	11,994 (11.5)
Rheumatic disease[h]	76 (6.8)	2,415 (8.7)	14,341 (13.8)
Drugs that increase risk of falling and fracture, n (%)	764 (68.6)	23,529 (84.7)	86,522 (83.2)
Fracture history in the past 1 year,[i] n (%)			
Hip	100 (9.0)	6,334 (22.8)	0 (0)
Spine	310 (27.8)	4,929 (17.7)	0 (0)
Non-hip non-spine[j]	563 (50.5)	10,857 (39.1)	5,214 (5.0)
Fracture history in the past 2 years,[i] n (%)			
Hip	116 (10.4)	8,693 (31.3)	0 (0)
Spine	325 (29.2)	6,788 (24.4)	0 (0)
Non-hip non-spine[j]	607 (54.5)	15,551 (56.0)	7,630 (7.4)
Fracture history in the past 5 to 5 years,[k] n (%)	291 (17.4)	5,892 (21.2)	18,888 (18.2)
Use of glucocorticoids, n (%)	351 (31.5)	5,225 (18.8)	39,404 (37.9)
Osteoporosis diagnosis,[l] n (%)	991 (89.0)	8,858 (31.9)	14,389 (13.8)

[a] It is unlikely that patients are treated with non-romosozumab without meeting reimbursement criteria; poor use of ICD codes during vertebral fracture assessment likely accounts for the discrepancy observed between non-romosozumab treatment and recorded rates of vertebral and hip fractures. [b]Despite the reimbursement criteria for romosozumab specifying fractures sustained in the past year, a 2-year cut-off was used to define cohort 2 as treatment lasting times may surpass a year. Select additional non-hip non-spine fractures were included in the definition of OP-related fracture, based on clinical practice in Sweden. [c]Includes alendronate and risedronate. [d]Treatment history can include more than one treatment for each patient; OP treatment naïve includes patients who had never received prior community- nor outpatient pharmacy-dispensed OP treatments. [e]Includes: myocardial infarction, congestive heart failure, peripheral vascular disease, cerebrovascular disease. [f]Includes: diabetes without chronic complication, diabetes with chronic complication. [g]Includes: pulmonary heart diseases, chronic lower respiratory diseases, lung diseases due to external agents, other interstitial pulmonary diseases with fibrosis, and respiratory conditions due to inhalation of chemicals. [h]Includes: rheumatoid arthritis and related conditions, systemic lupus erythematosus, systemic sclerosis, dermatomyositis and polymyositis, overlap syndromes, polymyalgia rheumatica, and other systemic involvement of connective tissue. [i]Includes antipsychotics (lithium excluded), anxiolytics, hypnotics and sedatives, antidepressants, vasodilators used in cardiac diseases, antihypertensives, diuretics, beta blocking agents, calcium channel blockers, renin-angiotensin system inhibitors, alpha-adrenoreceptor antagonists, dopaminergic agents, opioids. [j]Fracture history can include more than one fracture across the three categories. [k]Previous glucocorticoid use defined as a minimum cumulative dose equivalent to ≥450 mg prednisolone within a three-month time window within the baseline period. [l]Includes: osteoporosis with current pathological fracture, osteoporosis without pathological fracture. OP= osteoporosis; SD= standard deviation.

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AN EXPLORATION OF CULTURE DEPENDENT MODIFIABLE RISK FACTORS FOR LOW BACK PAIN IN ADDIS ABABA, ETHIOPIA: - DEVELOPING AN INTEGRATED PREVENTATIVE MODEL

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Background: The magnitude of LBP has increased in recent years. It has remained neglected with profound negative impact on the society. The risk factors continue to increase throughout communities as a result of limited preventive methods. Aim: The aim of this study was to offer in-depth exploration of cultural and social factors in vulnerability to LBP in order to develop a culturally sensitive integrated preventative model in Addis Ababa, Ethiopia.
Methods: A sequential explanatory mixed methods research design was employed to investigate the complex phenomenon of the study. Quantitative and qualitative data was collected through a combination of data collection tools that included interviewer-administered questionnaires and semi-structured interviews from both the back patients and healthcare providers in each of the selected public hospitals. Participants with back pain and healthcare providers working in the public hospitals were identified and sampled through a simple random sampling and purposive sampling technique, respectively. Findings: In the first phase, 170 participants took part in the study. Back pain is a multifactorial disorder, where the contributions of bio-medical and cultural factors for its occurrence are noteworthy. Chi square analysis showed a statistical association between seventeen variables of interest related to the participant group of individuals affected by LBP. In the second phase, back patients perceived that they were predisposed to LBP due to lack of knowledge and awareness on available prevention methods. Additionally, healthcare providers were blamed for their limited involvement in awareness-building about the severity and impacts of LBP. The low awareness rates were associated with increased risk of the development of LBP among the productive group of the community members. Conclusions: Prevention of LBP should not be seen as only involving bio-medical factors bust also other influences that include cultural and social factors. The emergent model has the benefit of integrating bio-medical, cultural and social modifiable factors for the prevention of LBP. Key concepts: LBP, culture, modifiable risk factors, non-modifiable risk factors, socio-demographic factors, psychosocial factors, work-related factors, socio-cultural factors.

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DEVELOPMENT OF A COST-EFFECTIVE OSTEOPOROSIS RISK SCORING SYSTEM FOR EARLY DETECTION IN LOW-RESOURCE SETTINGS: A COMMUNITY-BASED APPROACH

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Purpose:
Osteoporosis poses a significant public health burden, particularly in developing countries where advanced screening tools like dual-energy X-ray absorptiometry (DXA) are scarce. This study aimed to develop and validate a simple, community-based osteoporosis risk scoring system that can be used in low-resource settings to identify high-risk individuals for early intervention.
Methods:
A cross-sectional study was conducted in Karachi, Pakistan, involving 750 participants aged 40 years and above who attended a public hospital for routine health check-ups. A structured questionnaire, based on key osteoporosis risk factors, was developed and administered to collect demographic, clinical, and lifestyle data. Radiographic assessments, including vertebral X-rays to detect compression fractures and osteopenia, were performed on a subset of participants. Points were assigned for various risk factors, including age, gender, BMI, smoking status, alcohol consumption, history of falls, and X-ray findings. Participants were stratified into four risk categories (low, moderate, high, and very high) based on their total score. Statistical analysis, including multivariate logistic regression and receiver operating characteristic (ROC) curves, was used to assess the score's predictive accuracy.
Results:
The scoring system successfully categorized participants into low (38%), moderate (32%), high (20%), and very high (10%) risk groups. The model demonstrated strong predictive validity, with an area under the ROC curve (AUC) of 0.82. Sensitivity was 83%, and specificity was 75%, with a positive predictive value of 47% and a negative predictive value of 95%.
Conclusion:
This osteoporosis risk scoring tool offers a simple, cost-effective method for early identification of high-risk individuals in low-resource settings. It can significantly improve screening rates, allowing for timely interventions to prevent osteoporotic fractures in underserved populations.

P959

UNDIAGNOSED VERTEBRAL FRAGILITY FRACTURES IN PATIENTS WITH DISTAL RADIUS FRAGILITY FRACTURES: AN OPPORTUNITY FOR PREVENTION OF MORBIMORTALITY IN OSTEOPOROTIC PATIENTS IN DEVELOPING COUNTRIES

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Purpose: This study's main goal was to look into the frequency, location, kind, and severity of asymptomatic vertebral fragility fractures (VFF) in people who had fractures of the fragility of the distal radius. Although VFF is frequently misdiagnosed, it is linked to higher mortality, morbidity, and hip fracture risk. The study also attempted to investigate the relationship between VFF and certain demographic and lifestyle factors, as well as FRAX data, in this patient population.

Methods: Between Jan 2021 and Jan 2022, individuals with low-energy distal radial fractures who presented to the emergency room of tertiary care hospital of karachi Pakistan were the subject of a cross-sectional study and were 45 years of age or older except those who fitted the exclusion criteria (n=208). The thoracic and/or lumbar spine was imaged using radiology, and information on demographics, way of life, and FRAX (Fracture Risk Assessment Tool) was gathered. Using the Genant semiquantitative approach, an impartial and blinded orthopaedist identified VF in the images and determined their severity. SPSS version 20 was used to analyse the data.

Results: 211 (41.21%) of them were found to have radiographic VFF and Only 12 (2.34%) of the 512 patients who were tested were getting osteoporotic therapy. The thoracic spine (32.7%), followed by the lumbar spine (43.12%), was the area most frequently afflicted. In 24.17% of the patients, multiple fractures of the thoracolumbar spine were found. The wedge form (54.5%), followed by biconcave (30.81%) and crush (14.7%), was the most prevalent VFF type. The majority of detected VFF were rated as having a 25–40% height loss (64.9%) then severe (>40%) fractures (35.1%), according to the Genant grading method. Notably, there were no variations in smoking, drinking, BMI, or FRAX score between patients with and without VFF that were statistically significant.

Conclusion: Based on our study's findings, it's clear that osteoporotic vertebral fragility fractures occur in almost half of individuals with distal radius fractures. The lumbar spine is notably the most affected region, predominantly with wedge fractures. Given the high prevalence of asymptomatic vertebral fragility fractures (VFF), proactive measures are necessary to mitigate associated risks. Prioritizing comprehensive fall risk assessments for these patients and interventions to enhance bone mineral density and strength are crucial. Early identification of asymptomatic VFF enables timely intervention, optimizing patient care and minimizing the risk of complications in this vulnerable population

P960

CLINICAL CORRELATES OF NUTRITIONAL STATUS AND PONSETI TECHNIQUE SUCCESS IN CLUBFOOT PATIENTS

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Objective: Malnutrition is a critical health issue, particularly prevalent in developing countries, and is a major risk factor for diseases and mortality in children. Clubfoot or congenital talipes equinovarus (CTEV) is a common form of congenital orthopedic abnormality, and the Ponseti method has become the gold standard for its treatment over the last two decades. The primary objective of this study was to determine the prevalence of malnutrition in clubfoot patients and its impact on the outcome of the Ponseti technique in patients presenting to the Orthopedic Clinic of a tertiary care hospital in Karachi, Pakistan. Additionally, we aimed to assess the correlation between clinical tests, such as CBC, serum albumin levels, serum electrolytes, and nutritional status.

Methods: We conducted a cross-sectional study from January to December 2022, including a total of 153 clubfoot patients. The WHO classification of weight-for-age index was used to assess the nutritional status of patients, and clinical tests were also conducted to evaluate the correlation between malnutrition and the outcome of the Ponseti technique. Statistical analysis was performed with a P value ≤ .05 deemed significant.

Results: Of the 153 patients, 121 (74.5%) were in good nutritional status, while 32 (25.5%) were malnourished. The average number of casts required per patient and the proportion of patients requiring 6 or more casts were higher in the malnourished group (45.5% vs. 21.42%). The number of Achilles tenotomy procedures performed in the malnourished group was also higher (76.4% vs. 51.8%). Clinical tests showed a direct correlation between nutritional status and outcomes of the Ponseti technique.

Conclusion: Our study reveals a significant correlation between patients' nutritional status and the outcome of the Ponseti technique. Malnutrition can lead to an increased number of casts required for treatment and a higher likelihood of relapse and failure of treatment. The study also highlights the importance of clinical tests in evaluating the nutritional status of patients and its correlation with the outcomes of the Ponseti technique.

P961

REVOLUTIONIZING OSTEOPOROTIC DISTAL RADIUS FRACTURE CARE IN ASIA: TERIPARATIDE'S SWIFT ACCELERATION OF HEALING IN A PIONEERING DOUBLE-BLINDED TRIAL

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Objective:
As the Asian population experiences rapid aging, osteoporosis emerges as a prominent and costly health concern. Distal radius fractures, among the most prevalent fractures, are associated with an elevated risk of subsequent fractures. The swift attainment of union is crucial for the early resumption of daily activities and the mitigation of complications. Although teriparatide has demonstrated efficacy in accelerating fracture healing, there is a dearth of literature on its application in osteoporotic distal radius fractures among the Asian population. This study aims to evaluate the potential of teriparatide in expediting fracture healing.

Method:
A double-blinded randomized controlled trial, conducted from January 2015 to June 2019, included patients with extra-articular osteoporotic distal radius fractures managed conservatively with casting. The primary objective was to compare the impact of 8 weeks of once-daily subcutaneous teriparatide (20 micrograms) versus a placebo on the time to radiographic healing. Radiographic healing was defined by cortical bridging in three of four cortices, with secondary objectives including the time to healing of four cortices, assessment of anatomic deformity, and functional evaluations. Patients underwent screening on the day of the fracture, followed by randomization, an 8-week treatment period, an 8-week follow-up, and a safety extension for an additional 36 weeks.

Results:
Out of 214 screened patients, 202 women were enrolled, with 12 discontinuing before or during treatment. The remaining 202 women were randomly assigned to once-daily placebo (n 107) or 20 mg teriparatide (n 107). The median time to healing was significantly shorter in the teriparatide group (95% CI 2.5 to 0.7 weeks, p .005), with no significant between-treatment differences in secondary objectives. Both groups exhibited significant improvements in pain scores, functional tests, and grip strength compared to baseline.

Conclusion:
This study demonstrates that teriparatide (20 micrograms) accelerates the time to healing in conservatively managed distal radius osteoporotic fractures. Additionally, there were significant improvements in pain scores, functional tests, and grip strength after the 8-week treatment period. This suggests the potential for teriparatide to enhance fracture repair in this population.

P962

TERIPARATIDE INTERVENTION IN STEROID-INDUCED OSTEOPOROSIS: UNVEILING THE PREVALENCE, CHARACTERISTICS, AND THERAPEUTIC IMPACT ON VERTEBRAL FRACTURES

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This study explores the prevalence and management of vertebral fractures (VF) resulting from steroid-induced osteoporosis, with a specific focus on the role of teriparatide. Under the headings of Objective, Methodology, Results, and Conclusion, we investigate the impact of long-term glucocorticoid therapy on VF, characterize their occurrence, severity, and location, and assess the efficacy of teriparatide in managing these fractures.

Objective:
To determine the prevalence of asymptomatic vertebral fractures, characterize their location, type, and severity, and evaluate the role of teriparatide in managing fractures in patients on long-term glucocorticoid therapy.

Methodology:
This cross-sectional study involved screening 415 patients on prolonged steroid therapy for eligibility. Data collection included demographic, lifestyle, and FRAX information, along with radiological imaging of the thoracic and lumbar spine. An independent orthopedist, blinded to patient details, reviewed images for VF and utilized the Genant semiquantitative method for severity quantification. Additionally, the study explored the relationship between prior fractures and the risk of new fractures.

Results:
Among the screened patients (mean age 45.3 ± 25.12 years), 65.30% exhibited radiological VF. The thoracic spine (52.02%) was the most affected location, with wedge fractures being the most prevalent type. Teriparatide significantly reduced new VF compared to the placebo group. The study also observed prior fracture healing, as evidenced by reduced pain scores and improved quality of life in the teriparatide group.

Conclusion:
This study underscores a high prevalence of VF in patients on long-term glucocorticoid therapy, emphasizing an increased risk of new VF and non-VF. Teriparatide emerges as a promising treatment option, demonstrating greater increases in bone mineral density and significantly fewer new vertebral fractures. The findings suggest teriparatide's potential effectiveness in managing vertebral fractures secondary to steroid-induced osteoporosis, particularly in developing countries.

P963

A COMPARISON OF POSTOPERATIVE OUTCOMES BETWEEN INTERNAL BRACE AUGMENTED HAMSTRING TENDON AUTOGRAFT ACL RECONSTRUCTION AND NON-AUGMENTED HAMSTRING TENDON AUTOGRAFT

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Anterior cruciate ligament (ACL) is the most injured knee ligament. The gold standard for management of acute ruptures of ACL is surgical treatment with ACL reconstruction (ACLR) using tendon or ligament autograft. *Background*. Internal brace augmented ACL reconstruction is a technique that marries a previously published technique with the potential advantages of suture tape augmentation to increase the biomechanical strength of the reconstruction at the time of surgery and potentially reinforcing the graft thereafter**.** *Methods*. Patients were randomly assigned into an experimental group or a control group. A total 67 patients were included in the study 36 patient underwent ACLR with hamstring tendon autograft and 31 patients underwent ACLR with internal bracing. Self-reported outcomes were measured using IKDC, Tegner- Lysholm and KOOS at 1 month, 4 months, 8 months and 1 year post-operatively. Joint laxity was assessed post-operatively at 4 months, 8 months and 1 year *Results.* IKDC scores revealed significant differences ($p < .001$) between the two surgical techniques at all time points. Tegner-Lysholm scores by the one-year mark showed continued improvement on both groups. The control group mean score was 95.7 (median 97), whereas the intervention group exhibited enhancement with a mean score of 98.5 (median 100). The intervention group recorded a mean KOOS score of 67.8 (median 69), indicating comparatively better early functional recovery and knee-related quality of life than the control group's mean score of 53.9 (median 52). The consistent negativity of the pivot shift test results in both groups suggests that most patients maintained a stable knee joint post-surgery, regardless of whether they received the intervention or not. *Conclusion*. The study concludes that hamstring autograft with internal bracing offers superior self-reported outcomes and knee stability compared to autograft alone, emphasizing the need for optimized surgical techniques to enhance patient outcomes and improve postoperative quality of life.

P964

TARGETED THERAPY AND ONCOLOGICAL RISK: EVALUATION OF RHEUMATOLOGISTS' KNOWLEDGE AND ATTITUDES

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Introduction: While the use of targeted therapies (TT) in rheumatology offers promising prospects, it also raises complex questions, particularly in patients with a personal history of neoplasia. The aim of our study was to describe rheumatologists' attitudes and knowledge regarding the prescription of TT in patients with CIRD who have a history of neoplasia or presenting with an active neoplasia.

Patients and methods:

A 19-item questionnaire was administered to rheumatology residents.

Results:

Eighteen participants were included. The sex ratio was 0,29 and the mean age was 28 years [25-32]. The average duration of practice in rheumatology was 2 years.

Before prescribing TT, 50% systematically inquired about a family history of neoplasia and 66,7% systematically investigated personal history of precancerous lesions.

Regarding the screening methods used were as follows: Patient interview and clinical examination (100%), mammography (17,6%), Pap smear (17,6%), (0%), PSA testing (58,8%), and Hemoccult test (17,6%).

Before prescribing TT, physicians considered the following; the type of cancer (92,9%), date of diagnosis (64,3%), oncological treatments received (21,4%), duration of remission (100%), and the risk of recurrence (78,6%).

Regarding the timing of prescription of TT in patients with a history neoplasia in remission, 38,9% adhered to a 5-year waiting period and 61,1% believed that timing depended on the type of cancer and/ the TT.

In case of solid neoplasia history, the preferred therapies were: anti-CD20 (56,7%), anti-TNF alpha (27,8%), anti-IL6 (22,2%), Abatacept (11,1%), anti-IL17 (16,7%), anti-IL23 (11,1%), anti-IL23/12 (11,1%), and JAKI (11,1%). While in case of lymphoma history, they were as follows: anti-CD20 (64,7%) JAKI (29,4%), anti-TNF alpha (17,6%) and anti-IL17 (5,9%) and).

Once initiated, 82,4% recommended monitoring for recurrence of neoplasia and/or the development of a new neoplasia.

In case of active neoplasia in a patient with active rheumatic disease, 16,7% considered maintaining the patient on corticosteroids alone, 83,3% opted for a combination of corticosteroids and CsDMARDs, and X considered switching to TT.

Conclusion: Greater awareness is required to effectively manage patients with a history of neoplasia.

P965

ASSESSING THE DUAL IMPACT OF TERIPARATIDE AND ZOLEDRONIC ACID ON OSTEOPOROSIS AND SARCOPENIA IN POSTMENOPAUSAL WOMEN IN BANGLADESH

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Background:
Osteoporosis and sarcopenia are significant musculoskeletal challenges in postmenopausal women, characterized by bone mass loss and muscle weakness with substantial increase of fracture risks and reduction of quality of life. In most studies, sequential therapy with anabolics followed by antiresorptives was tested with promising results.This study aims to evaluate the efficacy of teriparatide followed by zoledronic acid in improving bone mineral density and functional outcomes in postmenopausal women with severe osteoporosis and osteoporosis with BMD >-3.5 in Bangladesh, exploring the potential dual impact on both bone and muscle health.
Objective:
The objective of this study was to determine whether this sequential therapy could effectively improve osteoporosis and sarcopenia, ultimately fracture riskreduction and sarcopenia improvement in postmenopausal women in a tertiary level hospital of Bangladesh.
Methods:
We conducted a prospective cohort study at Central Medical College, Cumilla, Bangladesh, from January 2020 to July 2023. The study included 400 menopausal women diagnosed with OP (T-score ≤ -2.5 with fragile fracture and T score < -3.5 without fracture) and sarcopenia (defined by low muscle mass, muscle strength, and physical performance). Participants received daily subcutaneous injections of teriparatide (20 mcg) for 18-24 months (Mean 21.3±2.4 months), followed by annual intravenous infusions of zoledronic acid (5 mg). Treatment continuation with zoledronic acid mean (SD) duration of treatment 14.7±3.6 months. BMD and T-scores at the lumbar spine and femur neck were measured at baseline and 42 months using DXA scans. Functional outcomes, including walking speed, Timed Up and Go (TUG) test, handgrip strength, and Relative Skeletal Muscle Index (RSMI), were assessed at the same intervals to evaluate both osteoporosis and sarcopenia progression.
Results :
Total of 430 menopausal women were screened, and 400 completed the study. The mean age of participants was 61.21 years. Significant improvements in BMD and T-scores at both the lumbar spine and femur neck were observed at all follow-up intervals. At desired follow up, lumbar spine BMD increased from 0.79 to 1.01 g/cm² (p = 0.001), and femur neck BMD increased from 0.63 to 0.77 g/cm² (p = 0.001). Corresponding T-scores improved from -3.31 to -2.53 (p = 0.001) and from -3.03 to -2.45 (p = 0.001) for the lumbar spine and femur neck, respectively.
Functional outcomes showed significant enhancements. Walking speed increased from 0.65 to 0.86 m/s, while TUG time decreased from 13.90 to 10.34 seconds. Handgrip strength showed marked improvements, with right handgrip strength increasing from 17.71 to 29.49 kg and left handgrip strength from 15.77 to 25.48 kg. The Relative Skeletal Muscle Index (RSMI) improved from 5.51 to 6.57 kg/m². Sarcopenia status changed notably over the 42-month period. Initially, 62.5% were Non-Sarcopenic, which fluctuated: decreasing to 52.75% at 12 months, increasing to 67.75% at 24 months, and further to 77.75% at 42 months. Conversely, Sarcopenic individuals, starting at 37.5%, rose to 47.25% at 12 months before declining to 32.25% at 24 months and 22.25% at 42 months, indicating a significant improvement in sarcopenia status over time.
Conclusions: Sequential treatment with teriparatide followed by zoledronic acid significantly improves bone mineral density and functional outcomes in postmenopausal women with severe osteoporosis and improved various parameters of sarcopenia.
Keywords: Osteoporosis, Bone Mineral Density, Teriparatide, Zoledronic Acid, Postmenopausal Women, Sarcopenia.
Acknowledgement: We acknowledge the help of radiology department and biochemistry department for their help in conducting the study.

P966

VALIDATION OF MODIFIED ELISA WITH ANTIGEN IMMOBILIZED ON MAGNETIC POLYACRYLAMIDE BEADS FOR MEASUREMENT OF ANTI-DSDNA ANTIBODIES

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Background: ELISA is currently one of the most widely used methods of laboratory diagnostics. One of the most promising improvements of ELISA is the use of an antigen immobilized not on the surface of a plate well, but on a mobile carrier containing a ferromagnet. One of the options for such a carrier is magnetically controlled polyacrylamide beads (MPB) obtained by emulsion polymerization.
Objective: to compare the characteristics of ELISA of antibodies to double-stranded DNA (anti-dsDNA) using MPB and standard indirect ELISA for the same analyte.
Materials and methods: ELISA of IgG class antibodies to dsDNA was used as a reference method, using kits manufactured by Orgentec Diagnostika (Germany). MPB was synthesized by emulsion polymerization; ELISA using MPB was described in detail in our previous works (Gontar I.P., 2006). A pool of sera from patients with systemic lupus erythematosus was used as a positive control; the presence of anti-dsDNA was confirmed by Western blotting. To construct a calibration curve, 8 replicates were prepared for each concentration. Nonparametric ROC analysis was performed by comparing 68 separate measurements of sera from patients with systemic lupus erythematosus (n=21) and a negative control replicate (PBS).

Results: LOD of anti-dsDNA using the reference method was 0.9 IU/ml, using MPB – 0.5 IU/ml. LOQ for the reference method was 2.2 IU/ml, using MPB – 1.8 IU/ml. The dividing point of positive and negative results, calculated by the ROC analysis, was 19.7 IU/ml for the reference method, and 18.4 IU/ml for MPB. On the linear sections of the calibration curves, the normalized difference between the arithmetic mean of the replicate series and the corresponding value of the regression equation was on average 3.4% for the reference method and 2.2% for MPB. The coefficient of variation on the linear sections of the calibration curves was on average 3.1% for the reference method and 2.5% for MPB. The dispersion of the residuals was on average 3.9 IU/ml for the reference method and 1.8 IU/ml for the measurement using MPG (p=0.001, Fisher's test).
Conclusions: the measurement of anti-dsDNA using MPB has advantages in terms of analytical sensitivity, accuracy, and convergence of results. This enables the wide application of this modification of ELISA in practice.

P967

APPLICATION OF DNASE I-SPECIFIC AUTOANTIBODIES FOR SLE DIAGNOSIS. QUANTIFICATION OF PERFORMANCE CHARACTERISTICS

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Background: Establishment a diagnosis of systemic lupus erythematosus (SLE) is currently often a very difficult task. The main reason for this is the insufficient diagnostic significance of individual signs of SLE found by means of physical examination, routine laboratory and instrumental tests. The use of various systems of diagnostic criteria allows increasing the accuracy of disease diagnosis only for cases with a detailed polysyndromic clinical picture. Given these circumstances, when verifying the diagnosis of SLE, the requirements for the diagnostic accuracy of tests significantly exceed the capabilities of the methods currently used, which necessitates the search for new laboratory markers of SLE.
Objective: Evaluation of the diagnostic accuracy of determining serum antibodies to DNase I in comparison with antibodies to dsDNA in differentiating SLE from other autoimmune rheumatic diseases.
Materials and Methods: Serum samples were obtained from 54 patients with verified SLE, 52 control patients suffering from the most common autoimmune rheumatic diseases (rheumatoid arthritis, systemic sclerosis, systemic vasculitis, dermatomyositis, Sjogren's disease) and 44 healthy volunteers. The concentration of antibodies to DNase I and dsDNA was measured by ELISA. The diagnostic accuracy of antibodies to DNase I and comparison of the two tests were performed using ROC analysis.
Results: Antibodies to DNase I were detected in 35 patients with SLE and in 8 patients in the control group, while no significant differences in the average antibody concentration were found. The optimal dividing point between these groups was the border of positive and negative results. For this point, the sensitivity was 64.81%; specificity - 84.62%; the likelihood ratio of a positive result was 4.21; the likelihood ratio of a negative result was 0.42. The area under the ROC curve for the concentration of antibodies to DNase I was 0.774, being not significantly different from the same indicator for antibodies to dsDNA.
Conclusions: When differentiating SLE from the most common autoimmune rheumatic diseases, the diagnostic accuracy of the test for serum antibodies to DNase I is very high and is not inferior to the generally accepted standard - the determination of antibodies to dsDNA.

P968

HIGH-THROUGHPUT SEQUENCING OF BONE METABOLISM GENES AND THEIR ASSOCIATION WITH OSTEOPOROSIS RISK

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Objective: The study aims to investigate the association of genetic variants in bone metabolism-related genes with the risk of osteoporosis using high-throughput sequencing technology. By identifying key genetic contributors, the research seeks to enhance early diagnostic strategies and personalize preventive measures for individuals at high risk.
Material and Methods: The study cohort consisted of 456 individuals (recruited at 1st Minsk City Hospital, Belarus), including 251 with osteoporosis and 205 age- and sex-matched controls. DNA was extracted from peripheral blood, followed by targeted sequencing of 68 genes implicated in bone metabolism using the Illumina platform, generating an average coverage depth of 100×. Functional annotations of significant variants were obtained using ANNOVAR and *in silico* tools such as SIFT and PolyPhen-2.
Results: A total of 1,238 single nucleotide variants (SNVs) and small insertions/deletions were identified across the targeted genes. Statistical analysis revealed significant associations between osteoporosis risk and several genetic variants. In the *COL1A1* gene, the rs1800012 T allele was associated with a 1.8-fold increased risk (p = 0.002). The *VDR* rs731236 variant correlated with reduced BMD (p = 0.005). The rs9533156 G allele in the *RANKL* gene was linked to elevated susceptibility (p = 0.01), while the *OPG* rs2073617 T allele exhibited a protective effect (p = 0.004). Additionally, the rs4754 A allele in the *SPP1* gene was associated with decreased BMD (p = 0.003), the rs2234693 C allele in the *ESR1* gene was linked to increased osteoporosis risk (p = 0.007), and the rs59983488 T allele in the *RUNX2* gene was associated with impaired bone formation (p = 0.002). Pathway enrichment analysis highlighted disruptions in Wnt/β-catenin signaling and osteoclast differentiation as key contributors to osteoporosis pathogenesis. Variants with predicted deleterious effects exhibited strong functional relevance in regulatory regions of the

affected genes.
Conclusion: This study underscores the critical role of genetic variants in bone metabolism-related genes in modulating osteoporosis risk. These findings provide a foundation for the development of genetic screening tools and targeted interventions aimed at reducing osteoporosis-related morbidity and mortality.

P969

SERUM LEVELS OF FERRITIN, INTERLEUKINS 6 AND 17A IN RHEUMATOID ARTHRITIS

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Objective. Rheumatoid arthritis (RA) is characterized by significant clinical polymorphism. To optimize the treatment of RA, it is necessary to develop a personalized approach based on the determination of the value of various biomarkers in the clinical course of RA. The aim of this work was to determine the levels of proinflammatory cytokines and ferritin in RA and to establish their effect on the clinical course of RA.
Material and Methods. The object of the study was 62 patients with RA and 33 healthy volunteers. Serum levels of interleukin 6 (IL-6), interleukin 17A (IL-17A), and ferritin were determined by ELISA.
Results. We found an increase ($p<0.05$) in the levels of cytokines IL-6 (4,98 pg, 95%CI:2,59-12,33) and IL-17A (0,00 pg, 95%CI:0,00-3,77), as well as ferritin (150,75 ng, 95%CI:76,50-207,56) in RA compared with the control group (0,11 pg, 95%CI:0,00-0,70; 0,00 pg, 95%CI:0,00-0,00; 41,16 ng, 95%CI:17,38-160,65, respectively. Subsequently, all patients were divided into three groups depending on the level of ferritin established in the study.
Differences in CRP levels were found between the study groups, it was the lowest in the low ferritin group compared to the other two groups ($p<0.05$). The levels of IL-17A and IL-6 did not differ between the groups ($p>0.05$).
Correlation analysis revealed that the level of IL-6 positively correlated with the level of CRP ($r=0.264$, $p<0.05$). The IL-17A level showed a significant association with systemic manifestations ($r=0.260$, $p<0.05$) and RF levels ($r=0.409$, $p<0.05$). Ferritin levels were correlated with CRP levels ($r=0.353$, $p<0.05$) and RF levels ($r=0.313$, $p<0.05$).
Conclusions. Serum ferritin is a promising and affordable biomarker in RA and can be used for personalized assessment of the condition of a patient with RA, differential diagnosis of anemia, and risk assessment of macrophage activation syndrome. The pathogenetic pathways of ferritin regulation in RA require further study.

P970

TIME OF ANTERIOR CRUCIATE LIGAMENT INJURY PROFESSIONAL AND RECREATIONAL ATHLETES

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Introduction: The anterior cruciate ligament (ACL) is the primary stabilizer and the most frequently injured ligament of the knee joint. ACL injuries typically occur during sports activities. Given their high incidence and the fact that they predominantly affect young, active individuals involved in sports and work, ACL injuries represent a significant epidemiological issue.
Objective: The aim of this study is to determine during which part of training, season, month, day of the week, and time of day ACL injuries most commonly occur among professional and recreational athletes.
Materials and Methods: The study included 1,152 patients treated at the Clinic for Orthopedic Surgery and Traumatology of the Clinical Center in Novi Sad between 2012 and 2017. Of the 1,152 participants, 671 were recreational athletes, while 481 were professional athletes.
Results:A significantly higher number of participants sustained ACL injuries in the middle of training ($p<0.001$). Recreational athletes most frequently sustained injuries in the middle of the season, whereas professional athletes were most commonly injured at the beginning of the season. Statistically, more injuries occurred in the middle of the season ($p<0.001$). Among recreational athletes, May recorded the highest number of injuries, while October was the critical month for professional athletes. Sunday was the day with the most injuries for recreational athletes, while Saturday was the critical day for professional athletes. There was a statistically significant difference in favor of injuries occurring on Saturdays ($p<0.001$). Both groups of athletes were most often injured in the afternoon.
Conclusion: The highest number of ACL injuries occurred in the middle of training, during the middle of the season, in October, on Saturdays, and in the afternoon. Injury prevention protocols could represent the next significant step in managing ACL injuries. Understanding when ACL injuries most frequently occur could yield long-term results and reduce the incidence of ACL injuries.

P971

UNDERSTANDING PAIN: HOW DO PATIENTS AND PHYSICIANS APPROACH IT?

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Objectives: We aimed to evaluate the characteristics of pain (that significantly impact the quality of life) and its changes after rehabilitation treatment.
Materials and Methods: A descriptive study of 354 patients admitted to our hospital over five months used specific questionnaires to gather demographic and medical data, pain attributes, onset, history and previous medication. The pain intensity was assessed on a visual analogue scale (VAS) before and after ten days of complex rehabilitation treatment (2,3). The p-value was calculated for statistical significance, and the correlation between variables was evaluated using the Pearson coefficient (-r).
Results: The group, aged between 30 and 83 years, included 245 women and 109 men who addressed rehabilitation treatment for different pathologies. 203 accused vertebral pain, followed by knee (60) and hip (37). 129 patients had high pain intensity (VAS > 7), 179 medium level (4-6), and 46 noted low intensity (< 4). Before the admission, 283 used medications for pain control, the majority (232) nonsteroid-anti-inflammatory drugs, followed if needed by corticosteroids, combined or alternated with painkillers. 82 patients took these pills, advised by friends, neighbours, media, or a pharmacist. Pain relief was achieved in 315 cases at discharge, with 31 remaining stationary. The average delta VAS for the group with acute pain was 3.38, for subacute, 2.15 and in the case of chronic pain, 1.91. A weak correlation was found between the VAS value at admission and delta VAS (r=0.37).
Conclusions: Most of the patients reported improvement after the rehabilitation therapy, considering that one-third had high-intensity pain on admission. The sooner that treatment was initiated, the more effectively it reduced pain. More than a quarter of the patients who took medication before admission didn't consult a specialist.
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P972

THORACIC SUBCUTANEOUS NODULAR STRUCTURES – A PRESENTATION OF TWO CASES

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Musculoskeletal ultrasound (MSUS), a technique used to assess joints and surrounding structures, could discover and initially describe subcutaneous nodules. To establish the relevance of this method, we aimed to present two cases of patients referred for ultrasonographic evaluation of these types of structures located in the thoracic area. A machine with a linear probe (10-14 MHz) was used, with the scanner settings adjusted and Doppler mode applied. The patients were clinically evaluated, and their medical history, current medication, and biological data were noted. Case report 1: The first patient, male, 56 years old, without traumatic or oncologic history nor biological changes, presented an immobile, firm subcutaneous nodule accompanied by pain located on the right sternoclavicular joint, which occurred 18 months ago and progressively increased in size. MSUS described a hypoechogenic, inhomogeneous, imprecisely delimited nodular structure of 2/2/2cm. The discontinuous and irregular bone cortex below presented Doppler signal. MRI identified a tumour involving the first rib and sternum. Plasmacytoma was diagnosed by biopsy, and the patient is now following radiotherapy with a positive response. Case report 2: The second male, aged 30, with an important inflammatory syndrome, presented a superficial nodule in the proximity of the right second sternocostal joint, which appeared 6 months ago, alongside local episodic pain, temporarily resolved after nonsteroidal anti-inflammatory drugs. MSUS identified a nodule of 3/3/0.4cm, relatively well-defined, hypoechogenic, slightly inhomogeneous, with Doppler signal, irregularity of the bone cortex of the second rib and enlarged superficial axillary lymph nodes with cortical Doppler signal. The CT scan showed osteochondritis in the second right rib and axillary adenopathies. The diagnosis of lymphoma was given on the biopsy of the structure and lymph nodule, and the chemotherapy was applied with good evolution.
Conclusions. Ultrasound is preferred as an initial investigation in assessing subcutaneous structures and is well tolerated by patients, although it does not give a final diagnosis. The report should include a detailed description of all ultrasound features, the suspected pathology, and recommendations for further investigations.

P973

THE ASSOCIATION OF HYPOGLYCEMIA AND FALLING RISK IN POPULATION WITH DIABETES: INSIGHTS FROM A NATIONAL SURVEY

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Background: Diabetes mellitus leads to various complications such as diabetic peripheral neuropathy and bone remodeling issues, both of each increase fall risk. Moreover, the management of diabetes often involves the risk of hypoglycemia, which can further compromise stability and increase falling. We aimed to evaluate the association of diabetes, its control and hypoglycemia occurrence with falling in Iran.

Methods: We used the nationally representative sample of STEPwise approach to non-communicable diseases (NCD) risk factor surveillance (STEPS) 2021 cross sectional study in Iran. Diabetes was defined as fasting blood sugar levels ≥126 mg/dL or current use of any antihyperglycemic medications. Diabetes control was determined based on hemoglobin levels <7%. Hypoglycemia was assessed through self-reports collected only from participants aware of their diabetes status. We asked about having hypoglycemia symptoms during the last two weeks. Falls were evaluated based on a question that asked if participants had experienced a falling accident leading to physical injury in the past year. Weighted prevalences were reported with corresponding 95% confidence intervals (95% CIs). Logistic regression analyses were performed to assess associations between diabetes status, control, hypoglycemia, and fall, with crude and age-sex adjusted odds ratios (ORs) and p-values reported. All statistical analyses were conducted using R version 4.4.1 with the survey package.

Results: The prevalence of falls among individuals with diabetes (n = 2437) was 3.32% (95% CI: 2.40-4.24), compared to 2.34% (2.01-2.67) in normoglycemic participants (n = 15641). For controlled diabetes (n = 748), the fall prevalence was 2.39% (1.16-3.62) versus 3.84% (2.59-5.08) in uncontrolled diabetes. Among participants aware of their diabetes, those with a hypoglycemia history (n = 416) had a prevalence of falling at 4.84% (2.56-7.13) compared to 2.74% (1.92-3.56) without hypoglycemia. After adjusting for age and sex, diabetes mellitus and controlled diabetes were not associated with increased odds of falling, while hypoglycemia showed significantly higher odds in the crude model (OR: 1.81 [1.92-3.56]), remaining elevated but not statistically significant after adjustment (adjusted OR: 1.79 [1.00-3.20]) (Table 1).

Conclusion: Although the fall is a rare condition and its prevalence is not statistically different between subgroups of diabetes, controlled diabetes, and hypoglycemia, the odds of falls are increased in people with diabetes who experience hypoglycemia. These findings underscore the importance of effectively monitoring hypoglycemia to prevent falls and their consequences in individuals with diabetes.

Table 1: Association between diabetes, controlled diabetes and history of hypoglycemia and fall.

Variable	Categories	Crude		Age-Sex adjusted	
		OR (95%CI)	P value	OR (95%CI)	P value
Diabetes	No	Ref			
	Yes	1.44(1.04-1.98)	0.02	1.11(0.8-1.55)	0.524
Controlled Diabetes	No	Ref			
	Yes	0.61(0.33-1.15)	0.127	0.6(0.32-1.12)	0.11
Hypoglycemia	No	Ref			
	Yes	1.81(1.92-3.56)	0.047	1.79(1-3.20)	0.051

P974

THE ASSOCIATION OF ESTROGEN RECEPTOR PVUII POLYMORPHISM WITH OSTEOPOROSIS IN BUSHEHR COHORT FROM IRAN

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Objectives: Genetic studies suggest that the polymorphisms of the gene estrogen receptor (ER), important in calcium absorption and bone strength, are associated with osteoporosis in different populations. In this study, we aim to assess the association of *PvuII* polymorphism of ER with osteoporosis within an Iranian population.

Material and Methods: People who participated in this study were selected from the Bushehr cohort, the Iran population. From 283 individuals recruited 85 were diagnosed with osteoporosis and 198 were normal. Genotyping was done by polymorphism chain reaction (PCR) followed by restriction fragment length polymorphism (RFLP) and Statistical software for data science (Stata/SE 12.0) was used to assess the association between genotype and allele frequency with osteoporosis and *pvalue*<0.05 was considered as significance.

Results: The frequency of genotypes CC, TC, and TT were as follows in patients with osteoporosis and without respectively: *N*= 17/44; 46/97; 22/57. The frequency of ER *PvuII* T and C alleles among patients with osteoporosis and without were as follows: *N*=90/211; 80/185. When the association between genotype and allele frequency of patients with osteoporosis was assessed compared to normal individuals using chi-square cross-tabulation there was no significant association. Also, when the results were adjusted for age, sex, BMI status, menopause status, and quality of bone using both one-variable and multi-variable logistic regression (for genotype frequency [TT *vs.* CC]: OR: 0.66; 95%CI [0.2-1.9], *p*=0.44; for allele frequency [T *vs.* C]: OR: 1.17;95%CI [0.7-1.9], *p*=0.53) there was no significant association.

Conclusions: Contrary to a high prevalence of osteoporosis in Iran there was no study evaluating the association of ER *PvuII* polymorphism with osteoporosis. Evaluating this polymorphism

in the elderly population of the Bushehr cohort contributes to our understanding of the genetic basis of osteoporosis among the Iranian population. However, our non-significant result might come from our small study population. The genetic study of more patients with osteoporosis in populations like Iran can help us for a better understanding of the biological process underlying osteoporosis as well as the development of new therapies among others.

P975

AGGRESSIVE AND UNCOMMON SOFT TISSUE SARCOMA OF THE EXTREMITIES: THE MYXOFIBROSARCOMA

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Objectives: To learn more about myxofibrosarcomas, which are a group of rare and heterogeneous tumors with various subtypes and prognosis. They are differentiated by their local infiltration activity and extremely high rate of local recurrence.
Material and Methods: Myxoid-like soft tissue lesions can be benign or malignant. They can present as cysts on radiologic examination and share histological characteristics. Myxoid liposarcoma, myxoid leiomyosarcoma, myxoid chondrosarcoma, ossifying fibromyxoid tumor, and myxofibrosarcoma are all malignant. Myxofibrosarcoma, a frequent kind of sarcoma in elderly persons, is a slow-growing, painless mass with larger tumors that may cause pain. Pathologists classify myxofibrosarcoma into three classes using a system developed by the French Federation of Sarcoma Group Cancer Centres (FNCLCC). This approach determines tumor grade using three microscopic features: differentiation, mitotic count, and necrosis.
Results: The imaging test includes US, CT, and MRI scans, which can establish its presence.
Surgery is the primary treatment for sarcoma; resection can be extensive, but recurrence is usual. Radiotherapy can be used as a neoadjuvant or adjuvant treatment to improve local control rates, whilst chemotherapy is utilized to reduce large tumors before surgery.
Conclusion: Soft tissue sarcomas are exceedingly rare malignancies; myxofibrosarcoma, a member of this diverse category, is a connective tissue-based cancer. It is one of the most frequent forms of sarcomas in older persons, with locally infiltrative activity and a very high rate of local recurrence. The diagnosis is difficult due to the various types of presentation, and all radiologists should be familiar with the radiological findings displayed in this case in order to raise the suspicion of this specific type of tumour, which was verified only by one excisional biopsy in its histology.
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• Disclosures: None

P976

BONE TURNOVER SUPPRESSION RATE ACCORDING TO OFF-TREATMENT AND ANTI-RESORPTIVE INTERVENTIONS: A STRATIFICATION ANALYSIS

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Objectives β-isomerized C-terminal telopeptide (β-CTX-I) is a bone turnover marker used for osteoporosis management. Biochemical assays, nomenclature, and clinical application standards have been published. Nevertheless, studies on reference intervals are still needed. Our objective is to evaluate β-CTX-I values according to its anti-resorptive (AR) effect on- and off-treatment in postmenopausal women.
Material and Methods The study employed a non-random, consecutive sampling approach. Eligible criteria were postmenopausal women assisted at a Fracture Liaison Service (FLS) in Brazil. Exclusion criteria were chemotherapy, rheumatological conditions, and chronical kidney disease. Expected β-CTX-I levels were defined according to different ARs. Higher potency AR denosumab (DMAB) is expected to suppress β-CTX-I levels below 0,100 ng/mL. β-CTX-I was expected above 0,350 ng/mL for off-treatment (Off-T) patients, that were used as controls. Between DMAB and Off-T, HRT levels were expected to be under 0,350 ng/mL and BIS levels under 0,250 ng/mL. The agreement between expected and observed β-CTX-I for each drug was evaluated. Samples were collected after 8-hour overnight fasting. Previous physical activity was avoided and Manual ELISA CrossLaps™ assays were performed at one single facility.
Results One-hundred postmenopausal women had β-CTX-I, calcium, PTH, and vitamin D measured. The results were grouped according to the treatment used. A total of 42 from 43 (97,6%) Off-T patients, 22 of 22 (100%) DMAB group, 5 of 7 (71,4%) HRT group, and 26 of 28 (92,8%) BIS group, showed β-CTX-I levels according to the expected cutoffs described above. Off-T and DMAB patients showed the best correlation of expected vs. observed β-CTX-I levels; while HRT showed the worst.
Conclusions β-CTX-I is a reliable tool to assess treatment response, notably for BIS and DMAB. Non-suppressed bone turnover can also be assessed in Off-T patients. Treatment response can be stratified for different ARs. β-CTX-I suppression thresholds may be individualized according to drug potency and help to evaluate adherence on a clinical setting. Further studies are needed to define accurate β-CTX-I cutoffs for different ARs.

P977

EXPLORING BONE HEALTH IN CYSTIC FIBROSIS: INSIGHTS FROM A PORTUGUESE COHORT

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OBJECTIVE: To evaluate the prevalence and progression of bone disease (BD) in Portuguese cystic fibrosis (CF) patients and its association with clinical and biochemical factors.

METHODS: A retrospective, observational study was conducted using medical records of adult CF patients followed at a tertiary hospital in Portugal. Data on sociodemographic characteristics, lung function tests, biochemical markers of bone health, and dual-energy X-ray absorptiometry (DEXA) scans were collected. DEXA results included Z-scores and bone mineral density (BMD) values from the first and most recent scans. Patients were classified based on the presence of BD (osteopenia or osteoporosis, defined by Z-scores from the lumbar spine, total femur, and femoral neck [FN]). Comparative analyses were performed between patients with and without BD, and longitudinal changes in Z-scores and BMD were assessed.

RESULTS: Of the 39 patients included in the study, 22 (56.4%) were women, all premenopausal, and the median age at the time of the most recent DEXA scan was 32.0 years (IQR 20.0). The median BMI was 20.95 kg/m² (IQR 4.12), with 8 patients (20.5%) having a BMI <18.5 kg/m². The mean 25(OH)vitamin D level was 27.72 ± 13.19 ng/mL, with 21 patients (53.8%) exhibiting vitamin D deficiency (levels <20 ng/mL). Thirty-four patients (87.2%) were on cholecalciferol supplementation.

Of the 25 patients (64.1%) with BD, 10 (25.6%) had osteoporosis, and 8 (20.5%) had a history of prior or current bisphosphonate therapy. Only one patient had a fragility fracture. Patients with BD showed significantly lower %forced vital capacity (p=0.016) and higher parathyroid hormone levels (p=0.019) compared to those without BD, with no other significant differences.

Among the 35 patients with previous DEXA scans, a paired-samples t-test revealed a statistically significant decrease in FN BMD between the first and most recent scans (mean decrease: 0.041 g/cm³; p=0.019).

CONCLUSION: Despite their young age, BD is highly prevalent among patients with CF and appears to be associated with reduced pulmonary function. Despite widespread cholecalciferol supplementation, vitamin D deficiency remains common. A significant decline in FN BMD over time underscores the importance of early detection and targeted interventions to address bone health in this population.

P978

DENOSUMAB THERAPY IN SYSTEMIC MASTOCYTOSIS-ASSOCIATED OSTEOPOROSIS: A CASE STUDY

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CASE PRESENTATION:

A 64-year-old woman with a 27-year history of osteoporosis (OP) presented with multiple low-impact fractures, including vertebral, femoral, and rib fractures. Initially attributed to hyperparathyroidism (treated with parathyroidectomy resulting in normalization of her parathyroid hormone levels), her condition persisted despite alendronate therapy for over 20 years.

Due to a history of three anaphylactic episodes, two of which during anesthesia induction, she was referred to the Immunoallergology clinic. Initial studies documented a baseline serum tryptase of 380 µg/L (REF < 11.40 µg/L). Further investigations revealed normal complete blood count and biochemical studies, a bone marrow biopsy with histological and immunofluorescence findings consistent with systemic mastocytosis (SM), and a skin biopsy showing perivascular and interstitial mast cell infiltration. Thus, a diagnosis of SM was established.

As part of the SM work-up, bone densitometry was conducted, showing T-scores of -2.6 and -3.3 for the lumbar spine (LS) and femur, respectively. She was referred to the Rheumatology clinic, where it was concluded that her long-standing OP was secondary to SM. As such, she was started on biannual denosumab therapy, which she is currently maintaining. Follow-up DEXA scan showed significant improvement in LS bone mineral density (T-score -1.4 after 2 years of treatment).

DISCUSSION:

Although SM is a rare cause of secondary OP, it should always be considered in patients with unexplained osteoporosis, particularly in the presence of symptoms related to mast cell release. Tryptase measurement is the initial test, and the diagnosis can be definitively established with a bone marrow biopsy.

Skeletal involvement in SM is common. The interplay between the mediators secreted tends to favour bone resorption, either by promoting osteoclastic or inhibiting osteoblastic activity. As such, antiresorptive agents are the treatment of choice. Bisphosphonates are effective, however, given the increased evidence of the importance of the RANK/RANKL in the pathogenesis of the disease, denosumab therapy may be the preferred option, and in this case resulted in significant bone mineral density gain after two years of biannual injections.

P979

CELIAC DISEASE AND OSTEOPOROSIS: DEMOGRAPHIC AND CLINICAL INSIGHTS FROM A HOSPITAL-BASED STUDY

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OBJECTIVE: To describe the characteristics of celiac patients who develop osteoporosis (OP) in a Portuguese hospital center.
METHODS: We conducted a retrospective descriptive study, including patients diagnosed with celiac disease (CD) who were subsequently diagnosed with OP and referred for a Rheumatology consultation at a tertiary hospital in Portugal. Data on sociodemographic characteristics, biochemical markers, and dual-energy X-ray absorptiometry (DEXA) scans (baseline and 3-year follow-up) were collected.
RESULTS: Seven patients were included, with a mean age of 54.1 ± 3.0 years at OP diagnosis. Most were postmenopausal women (5/7, 71.4%). The mean BMI was 21.2 ± 0.9, and two patients were smokers (28.6%). Comorbid autoimmune diseases included psoriasis and type 1 diabetes mellitus (1 patient each). Diarrhea was the most common presenting symptom (n=4), followed by weight loss (n=3), oral ulcers (n=2), and nausea/vomiting (n=1). Two patients were asymptomatic. One patient had a family history of low-energy hip fracture, and another had a personal history of a low-energy forearm fracture.
Baseline DEXA scans revealed the lowest T-scores and Z-scores predominantly at the lumbar spine (6/7, 85.7%), with mean values of -3.18 ± 0.34 and -2.08 ± 0.49, respectively. Laboratory data showed that 100% of patients had vitamin D deficiency, including two with severe deficiency (<10 ng/mL). Anemia was observed in one patient. The mean calcium and alkaline phosphatase levels were 4.73 ± 0.10 mEq/L and 92.7 ± 11.6 U/L, respectively.
Five patients (71.4%) adhered to a gluten-free diet, and all received calcium and/or vitamin D supplementation. Only one patient received pharmacological treatment for OP during the first three years. Follow-up DEXA scans showed an overall improvement in T-scores (+0.50 ± 0.25) and Z-scores (+0.53 ± 0.22).
CONCLUSION: Osteoporosis is a significant concern in celiac patients, warranting early screening with DEXA, regardless of clinical severity or nutritional deficiencies. Despite dietary adherence and supplementation, these patients remain at risk. Rheumatologists should consider CD in cases of severe osteoporosis, low BMI, and vitamin D deficiency. These findings emphasize the need for a multidisciplinary approach to optimize management and outcomes.

P981

THE ASSOCIATION BETWEEN STATIN USE AND RISK OF FALL AND ITS OUTCOME AMONG OLDER ADULTS; BIRJAND LONGUITIDINAL AGING STUDY

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Introduction: Falls are a significant public health concern, particularly among older adults, where they represent one of the leading causes of injury, disability, and mortality. Identifying risk factors for falls is critical to developing effective prevention strategies. Statins, widely prescribed for their cholesterol-lowering effects and cardiovascular benefits, have raised questions regarding their potential impact on fall risk. While statins are generally considered safe, they can cause side effects such as muscle weakness (myopathy) and fatigue, which may impair balance and increase susceptibility to falls. Conversely, statins might indirectly reduce fall risk through improved vascular health and reduce inflammation, which can benefit physical functioning.
Methods: This study included 1348 patients interviewed and examined in the Birjand Longuitidinal Aging Study (BLAS). Their related data were documented regarding various factors, diseases, sociodemographic characteristics, and social and lifestyle habits. Finally, their association with falls and the history of statin use were evaluated, and correlation and relative incidence risk were calculated using univariate and multivariate logistic regressions.
Results: The variables between fallers and non-fallers were compared using two-sample T-tests.
Higher BMI (MD: -2.35, $p < 0.001$), higher Waist Circumference (MD: -3.28, $P<0.01$), Maximum Handgrip Strength (MD:4.57, $p < 0.001$), and Maximum Gait Speed (MD:0.16, $P = 0.0025$) were significantly different between faller and non-fallers. Moreover, female gender and less physical activity were significantly related to falling risk. Statin use showed no statistically significant association with the risk of falls (4.89% among statin users, 6.15% among non-statin users, $P= 0.408$). Subgroup analyses reveal some differences by cholesterol category but no strong or consistent associations with statin use.
Conclusion: This study showed that statin use does not consistently or significantly affect falls across models. Moreover, the male sex was consistently protective against falls. The logistic regressions revealed that higher BMI and older age are associated with increased fall risk in several models, and more activity levels significantly reduce fall risk.

P982

EARLY DETECTION OF OSTEOPOROSIS USING ARTIFICIAL NEURAL NETWORKS: A COMPARATIVE ANALYSIS OF MACHINE LEARNING APPROACHES

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Objective: To develop different machine learning models for early detection of osteoporosis and determine the most effective method in osteoporosis risk assessment by comparing their diagnostic performances.

Material and Methods: The study analyzed data from 5,831 individuals obtained from the National Health and Nutrition Examination Survey (NHANES) database between 2017-2019 (1). The dataset was first examined for missing data and outliers, and necessary preprocessing steps were applied. Data augmentation method was used to address dataset imbalance. Three different machine learning approaches were compared: logistic regression, random forest, and multilayer artificial neural networks. The multilayer artificial neural network was designed with an input layer, two hidden layers, and an output layer. The dataset was split into training (80%) and testing (20%) sets. Model performances were comparatively evaluated using accuracy, sensitivity, specificity, precision, F1-score, and area under the ROC curve (AUC).

Results: The multilayer neural network achieved the highest performance with 82% accuracy, 82% sensitivity, 31% precision, and 0.87 AUC score. The model successfully identified 82% of high-risk patients, enabling early-stage identification of osteoporosis cases. The random forest model achieved 86% accuracy, 59% sensitivity, 34% precision, and 0.84 AUC score, while the logistic regression model achieved 79% accuracy, 74% sensitivity, 27% precision, and 0.82 AUC score. When evaluated in terms of the F1-score, which is the most decisive among performance metrics, the multilayer artificial neural network reached the highest value at 45%.

Conclusion: The multilayer neural network demonstrated superior performance compared to other machine learning approaches in early detection of osteoporosis. High sensitivity rates indicate that using the model as an early diagnostic tool in clinical practice could both reduce healthcare costs and improve patient outcomes. This model, which can be particularly useful in evaluating risk factors, may contribute to early diagnosis of the disease. The findings emphasize the importance of integrating artificial intelligence tools in osteoporosis screening programs.

Table : Performance Comparison of Machine Learning Methods

Model	Precision	Sensitivity	Accuracy	F1-Score	AUC
Logistic Regression	0,27	0,74	0,79	0,39	0,82
Random Forest	0,34	0,59	0,86	0,43	0,84
Multilayer Artificial Neural Network	0,31	0,82	0,82	0,45	0,87

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P983

ASSOCIATION BETWEEN SERUM HEMOGLOBIN LEVEL AND BONE MINERAL DENSITY IN ADULTS: IRANIAN MULTI-CENTER OSTEOPOROSIS STUDY (IMOS)

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Objective

Previous studies have investigated the relationship between hemoglobin (Hb) levels and bone mineral density (BMD) with controversial findings. This study aimed to evaluate this association using data from the 4th Iranian Multicenter Osteoporosis Study (IMOS), a population-based national survey, including a population sample aged 50 years and older.

Material and Methods

The present study was conducted as a cross-sectional data analysis derived from the fourth round of the IMOS. Demographic information, Hb levels, and BMD measurements were collected. BMD was measured with dual-energy X-ray absorptiometry (DXA). Low BMD was defined as a T-score less than -1 at each site including hip, femoral neck, or lumbar spine. Multiple linear regression analysis was used to assess the relationship between Hb levels and BMD.

Results

This study included 1,426 participants (54.2% female) with the mean age of 62.6 ± 8.0 years. The mean Hb levels among patients with or without osteoporosis were 12.9 ± 2.0 mg/dl and

13.1 ± 1.9 mg/dl, respectively (p-value= 0.08). It was demonstrated a positive relationship between Hb levels and BMD at hip (β=0.0079, 95% CI: 0.002- 0.0135, p-value=0.006) and femoral neck (β=0.0064, 95% CI: 0.0015- 0.0113, p-value=0.01) in men but not in women. However, there was no significant correlation between Hb levels and spine BMD in either gender.

Conclusion

The findings highlight the complexities of the association between Hb and BMD, which is modified by variables such as bone region, gender, and study population characteristics. Future studies should unravel these associations and investigate the underlying mechanisms.

Keywords Hemoglobin level. Bone mineral density. Osteoporosis. IMOS. Iran

Table. Results of multiple linear regression to assess the relationship between Hb and BMD in Men

	Hip BMD			Spine BMD			Femoral Neck BMD		
Variable	**Beta**	**95%CI**	**P-value**	**Beta**	**95%CI**	**P-value**	**Beta**	**95%CI**	**P-value**
Hb	0.0079	0.002, 0.0135	**0.006**	0.0054	-0.0015, 0.0124	0.129	0.0064	0.0015, 0.0113	**0.01**
Age									
<65	Ref			---			Ref		
>=65	-0.0324	0.008, 0.0136	**0.008**	---			-0.0513	-0.0718, -0.030	**<0.001**
BMI	0.0109	0.008, 0.0136	**<0.001**	0.0096	0.0063, 0.0128	**<0.001**	0.008	0.006, 0.011	**<0.001**
Wealth Index									
2	-0.0004	-0.0379, 0.0378	0.998	-0.004	-0.050, 0.0409	0.840	-0.009	-0.041, 0.021	0.546
3	-0.0005	-0.040, 0.039	0.977	-0.0039	-0.051, 0.043	0.870	-0.0132	-0.047, 0.021	0.446
4	0.001	-0.034, 0.037	0.930	-0.0196	-0.0631, 0.0238	0.375	-0.018	-0.050, 0.012	0.237
5	0.0564	0.017, 0.095	0.005	0.0604	0.0121, 0.108	**0.014**	0.038	0.004, 0.072	**0.027**
Diabetes	0.0379	0.0114, 0.064	0.005	0.0527	0.0185, 0.0869	**0.003**	0.0313	0.0072, 0.0554	**0.011**
Vitamin D consumption	---			0.0860	0.0050, 0.167	**0.037**	0.068	0.005, 0.131	**0.034**
Fragility fracture	---			--			-0.051	-0.096, -0.006	**0.026**

Abbreviations: Hb, Hemoglobin; BMD, Bone mineral density; BMI, Body mass index.

P984

SCIENTOMETRIC ANALYSIS OF ACROMEGALY PUBLICATIONS: AN OVERVIEW OF THE STATE OF RESEARCH

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Objectives: Acromegaly is a rare hormonal abnormality caused by excessive growth hormone in the body that leads to excessive growth of bones and soft tissue. So, this research aims to provide an overview of the state of research in this field by analyzing the studies conducted during past years in the field of acromegaly.

Material and Methods: The search strategy was conducted in the Web of Science (WOS) database until August 14, 2024. All documents containing the word "Acromegaly" in the title or keywords were retrieved. The results were analyzed and illustrated using the bibliometrix R-package 4.1.1. and WOS software.

Results: 7444 documents were analyzed and the most published documents were articles (n=5033) and then by a difference, meeting abstract and review articles. The USA (n=1388), Italy (n=875), England (n=662), and France (n=471) have had the most scientific productions in the field of acromegaly, respectively. "University of London" (n=244) and "Assistance Publique Hopitaux Paris" (n=205) also were the most active organizations. "Annamaria Colao" (n=178) and "Andrea Giustina" (n=131) both from Italy and "Philippe Chanson" (n=130) from France are the most prolific authors. The "Journal of Clinical Endocrinology& Metabolism" (n=522), "Pituitary" (n=331) and "Clinical Endocrinology" (n= 317), have published the most articles in this field. Most of the articles were in English then in French and German Language. In addition, among these articles, 12 were Highly-Cited Papers (HCP) that "Shlomo Melmed" from the USA with 8 articles (79%) having the most HCP articles. "Oregon Health & Science University" in the USA has also published the most HCP articles(n=17) and "Journal of Clinical Endocrinology & Metabolism" (n=3) continues to publish the most articles including HCP in this field. The most of topics in these articles were "growth hormone", "growth factor-I", "quality-of-life" and "somatostatin analog therapy".

Conclusion: Many different studies have been conducted on acromegaly in the past years. Most of them were carried out in the USA and Italy countries, and the journal that published the most articles in this field, including HCP, was the "Journal of Clinical Endocrinology & Metabolism". More effective studies need to be done by researchers in this field.

Keywords: Acromegaly, Scientometric Analysis, Bibliometric Analysis

P985

BONY DEFORMITIES AND FRACTURES UNVEILING MCCUNE-ALBRIGHT SYNDROME: A CASE REPORT

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Introduction: McCune-Albright Syndrome (MAS) is a rare genetic disease characterized by polyostotic fibrous dysplasia, café-au-lait skin pigmentation and endocrinopathy. Additional features may include limb abnormalities, scoliosis, sensorineural hearing loss and precocious puberty[1].

Clinical case: A 42-year-old man with history of multiple fractures at a young age sustained a femoral shaft fracture in 2020 after a fall. In 2021 he suffered a fracture of the L1 vertebrae with no trauma. A CT scan revealed multiple expansive bony lesions with ground-glass appearance. X-rays showed abnormal bone growth and remodelling, affecting the iliac bone, femur, tibia, fibula and femoral head, along with limb deformities and scoliosis. Blood

tests showed hypercalcemia, hypophosphatasia, hypocalciuria, high levels of parathyroid hormone and alkaline phosphatase and low serum vitamin D. Procollagen Type 1 N-Terminal Propeptide and N-Telopeptide of Type I Collagen were marked elevated. He was diagnosed with non-toxic multinodular goitre. Genetic testing identified the c.601C>T, p.(Arg201Cys) mutation in the GNAS gene, confirming MAS.

Discussion: Polyostotic fibrous dysplasia is a common feature of MAS and results in abnormal bone growth and remodelling, predisposing pathological fractures, as seen in our patient. This case highlights the importance of scrutinize clinical history and combine imagological features and calcium-phosphate imbalance in order to recognizing MAS, with the genetic testing firming the diagnosis. MAS patients are prompt to fragility fractures, well recognized as cause of important health costs and impairing quality of life, thus, correct management is imperative.

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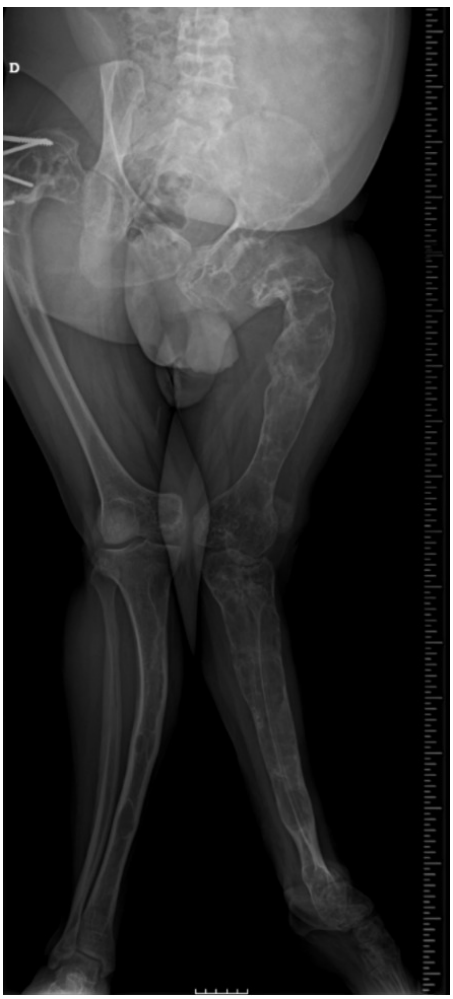
Figure 1: McCune-Albright syndrome: deformities of the limbs and areas of abnormal bone growth and remodelling.



P986

WHEN BONE VANISHES: A RARE SYNDROME

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Introduction: Gorham-Stout Syndrome (GSS) is a rare disorder of unclear aetiology, characterized by progressive osteolysis[1].

Clinical case: A 54-year-old woman with morbid obesity, type 2 diabetes, no smoking, alcohol or toxophiliac habits and hip and knee osteoarthritis reported progressive hip pain and gait limitation since 2022. There were no signs of inflammatory arthropathy and no phospho-calcium metabolism imbalance except for vitamin D deficiency.

Plain radiographies showed bilateral reabsorption of the acetabular head (picture 1A), not present in previously. Computer tomography (CT) scan (picture 1B) presented severe acetabular dysplasia with deformity and resorption of the femoral heads, significant sclerosis with intra-articular thickening and inflammatory pannus. The magnetic resonance imaging (MRI) (picture 1C-D) demonstrated femoral heads' bone loss and bone marrow infarction in the proximal right femur, suggesting rapidly destructive osteoarthritis.

The radiological and clinical findings are consistent with GSS.

Discussion: GSS is a rare disorder, characterized by destruction of osseous matrix resulting in osteolysis[1], which can involve one or multiple bone sites. There are multiple clinical presentations depending on affected bone, and unspecific symptoms are common, delaying diagnosis[1]. The prognosis is variable, depending on the existence of other manifestations, such as pleural effusion or development of complications as spinal cord involvement[1]. Reporting these cases and imaging findings is central for enhancing understanding and recognition of this condition.

References:

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Picture 1: 1A, hip radiographies show bilateral reabsorption of acetabular heads; **1B**, CT-scan presents severe acetabular dysplasia with femoral heads' deformity and resorption; **1C-D**, MRI scan demonstrates bone loss in both femoral heads.

P987

ERDHEIM-CHESTER DISEASE: A CASE STUDY HIGHLIGHTING DIAGNOSTIC COMPLEXITY

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Introduction

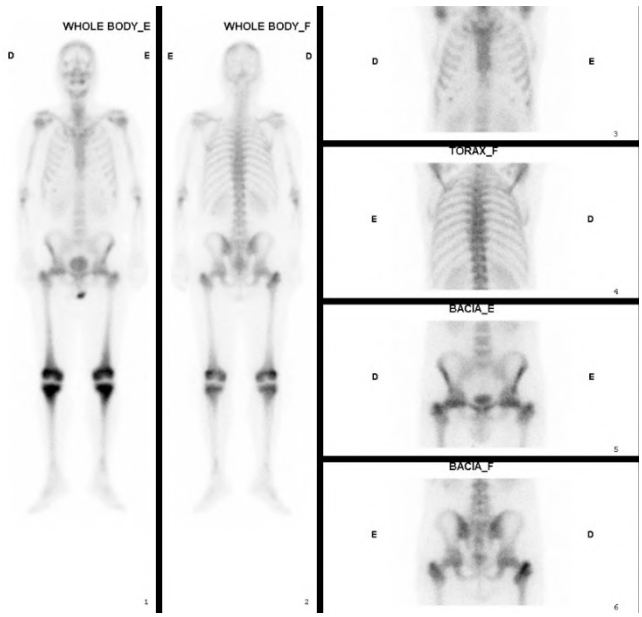
Erdheim-Chester disease (ECD) is a rare non-Langerhans histiocytosis, more frequent in elderly males. The clinical presentation is highly variable, making diagnosis challenging.

Case Report

We present the case of a 62-year-old male with prostate cancer and essential thrombocythemia (ET), the first diagnosed at 55 years old, currently receiving radiotherapy and hormone therapy, and the latter diagnosed at 56 years old, managed with hydroxyurea. In 2023, a PET scan revealed an asymptomatic right proximal femoral epiphyseal lesion that raised the suspicion of bone metastasis, evolution to myelofibrosis or possible chronic recurrent multifocal osteomyelitis. A subsequent biopsy showed fibrotic intertrabecular spaces without neoplastic involvement and no representation of hematogenous marrow. The patient also exhibited persistently elevated inflammatory markers. Due to these findings, he was referred to rheumatology in early 2024. A bone scintigraphy was ordered, revealing intense uptake in both femoral and tibial epiphyses and less intense uptake in the distal third of the tibial diaphysis and bilateral proximal femurs. Further imaging revealed an asymptomatic pericardial effusion. After a comprehensive evaluation by oncology, cardiology, haematology and rheumatology, given the combination of symmetric lower extremity bone lesions, chronic pericardial effusion of unknown aetiology and history of ET, ECD became a primary consideration. A posterior review of the biopsy indicated findings compatible with ECD, and genetic analysis confirmed a BRAFV600 mutation, establishing the diagnosis. Subsequent studies revealed bilateral orbital and perirenal involvement. He recently started vemurafenib.

Conclusion

This case highlights the diagnostic complexities of ECD, where a high index of suspicion was key. Biopsy is the primary diagnostic tool, but even if the pathological presentation is not sufficiently typical, ECD cannot be completely excluded, requiring comprehensive judgment alongside clinical and imaging findings. The BRAFV600 mutation was crucial in confirming the diagnosis and guiding treatment. Vemurafenib, a BRAF inhibitor, shows therapeutic potential, but its long-term efficacy and safety remain uncertain. Ongoing research is needed for better understanding and long-term management protocols.



P988

NUTRITIONAL OSTEOMALACIA CAUSED BY DIABETIC ENTEROPATHY: A CASE REPORT

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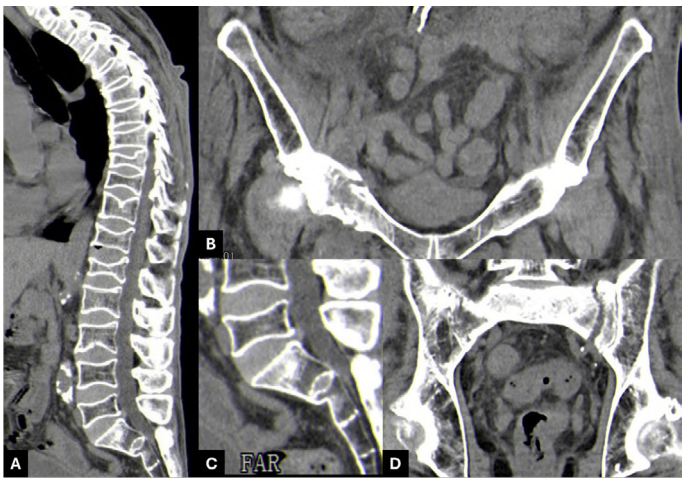
Osteomalacia (OM) is caused by inadequate mineralization of osteoid. Nutritional OM is the most common acquired form in adults, often due to low calcium and vitamin D intake.

Case Report: A 65-year-old man with type 1 diabetes and chronic diarrhoea due to diabetic enteropathy, was admitted for decompensated diabetes due to poor adherence. He presented insidious weight loss, diffuse bone pain in the pelvis and legs, muscle wasting and impaired gait in the past few months. Physical exam found sarcopenia, decreased lower limb proximal muscle strength and impaired gait. He had anemia, hypoalbuminemia, elevated alkaline phosphatase (ALP), severe hypovitaminosis D (3ng/mL) and low 24-hour urine calcium. Corrected calcium, phosphorus, magnesium, iPTH, C-reactive protein and urinary phosphorus were normal. Spinal CT showed multiple biconcave fractures of contiguous vertebrae in all segments - "codfish" vertebrae (fig.1A). Pelvic CT depicted multiple linear fractures in various stages of healing - Looser's zones (fig.1B-D). DXA showed low lumbar (-3,5) and femoral neck (-3.2) T-scores. Thoraco-abdominal-pelvic CT showed no malignant or mesenchymal tumours. Bone biopsy was not available. High dose calcifediol lead to clinical improvement and normal vitamin D and ALP within 4 weeks.

Conclusion: Diagnosing nutritional OM requires a high suspicion: symptoms are unspecific, asymptomatic hypovitaminosis D is common, and analytical findings may not occur simultaneously. Low BMD in DXA does not distinguish from osteoporosis, which often coexist. Calcifediol below 12ng/mL is known to impair mineralization and cause OM. Looser's zones and codfish vertebrae

are classic radiological features. Iliac bone biopsy is gold standard, but it is not widely available. Prompt treatment is crucial for prognosis.

Figure 1. A - Spinal CT depicting "codfish" vertebrae; B, C and D - Pelvic CT depicting fracture of the left sacrum, right iliac bone, right ischiopubic ramus and left acetabulum



P989

CHRONIC LOW BACK PAIN: THE EXTENT OF THE SOCIAL AND CLINICAL BURDEN

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Introduction

Assessing disease perception in patients with non-specific chronic low back pain (CLBP) is recognized as essential due to its impact on the prognosis of this condition [1]. This study aimed to explore the relationship between disease perception and the socioclinical characteristics of women with CLBP.

Patients and methods

This was a cross-sectional study involving female patients with CLBP. Disease perception was assessed using the Brief Illness Perception Questionnaire (BIPQ): a 9-item questionnaire with a total score ranging from 0 to 80, where higher scores indicate a perception of the disease as more threatening. Pain severity and functional disability were evaluated using the Visual Analog Scale (VAS) and the the Oswestry Disability Index (ODI) respectively. The level of statistical significance was set at $p < 0.05$.

Results

Fifty-six women with non-specific CLBP were included in the study. The mean age was 52.4 years [23–56], with a disease duration of 8.7 years [1–24] and 4.7 annual exacerbations [2–8] on average. Overall, participants spent 3.5 hours per day [1–6] engaging in sustained physical activity. The mean VAS score for low back pain was 4/10 [1–7]. Functional disability, assessed using the ODI, was minimal in 26.7%, moderate in 60.7%, and severe in 12.5% of patients. Additionally, 67.8% of the patients used pharmacological treatments to manage their CLBP and 23 patients (41%) completed their physiotherapy sessions. The mean BIPQ score was 53.2 [21–80]. The mean scores for the first eight BIPQ items were as follows: "Consequences" 6.3 [2–10], "Timeline" 5.8 [2–8], "Personal Control" 4.8 [1–9], "Treatment Control" 7.5 [3–10], "Identity" 6.7 [1–6], "Concerns" 6 [2–7], "Coherence" 5.4 [1– 6], and "Emotional Response" 6.9 [2–7]. The primary perceived causes of low back pain (item 9) were household chores (50.2%), prolonged standing (48%), heavy lifting (45%), stress (31.6%), and exposure to cold (12.6%). Perceiving the disease as more threatening was significantly associated with a higher number of exacerbations ($p = 0.032$) and greater pain severity ($p = 0.048$). The belief that symptoms would persist longer (item 2) was significantly associated with greater functional disability ($p = 0.022$) and more severe pain ($p = 0.01$). Pessimistic perceptions regarding the effectiveness of prescribed treatment (item 4) were significantly associated with older age ($p = 0.05$), a higher number of hours of sustained physical activity ($p < 0.01$), and greater functional disability ($p = 0.038$). A more negative emotional impact (item 8) was significantly associated with a higher number of exacerbations ($p = 0.01$), more hours of sustained physical activity ($p = 0.04$) and more severe pain ($p = 0.05$).

Conclusion

Our study highlighted that negative disease perceptions, especially concerning prognosis, emotional impact, and treatment effectiveness were significantly associated with pain severity, functional disability, and other socioclinical factors."

References

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P990

METHOTREXATE OSTEOPATHY - A CASE REPORT A RARE COMPLICATION OF COMMON MEDICATION

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Introduction

Stress fractures are cracks in the bones of the lower extremities caused by excessive strain or other factors that weaken the bone. Methotrexate can impair bone metabolism, leading to non-traumatic stress fractures, chronic pain, and subsequent immobility.

Methods

We present a case of a 66-year-old female with spontaneous, unhealed fractures of the lower limbs. She had a history of rheumatoid arthritis and leukopenia as part of Felty's syndrome. The patient was treated with methotrexate (20 mg weekly), folic acid, cholecalciferol (7,000 IU weekly), and occasionally filgrastim. She experienced progressively worsening pain in the right ankle, both feet and knees, without any evident injury. On the scale, pain was assessed as 8/10 and rendered the patient unable to walk. Magnetic resonance imaging (MRI) of the bones revealed stress frac-

tures of the left calcaneus, the distal epiphysis of the right tibia, the second metatarsal of the right foot, and the medial condyle of both knees. Bone mineral density was decreased to osteoporotic levels, with the lowest T-score of -3.0 SD. Laboratory findings were in normal range as follows: corrected calcium 2.36 mmol/L, phosphate 1.02 mmol/L, alkaline phosphatase (AF) 1.89 µkat/L, creatinine 57 µmol/L, 25-hydroxyvitamin D 73.2 nmol/L, iPTH 29 ng/L, CTX 0.476 µg/L, and PINP 59.7 µg/L.

Results

Based on the fractures in typical locations and the absence of other causes, methotrexate osteopathy was confirmed. In consultation with the rheumatologist, methotrexate was discontinued, and treatment with teriparatide (20 µg daily) was initiated. One month after starting teriparatide therapy, the patient reported reduced pain, assessed on a scale of 2/10. Laboratory results showed an increase in alkaline phosphatase to 3.10 µkat/L, consistent with increased bone formation. However, a follow-up MRI showed no signs of bone healing.

Conclusion

Methotrexate osteopathy is a rare treatment complication. It is characterised by non-traumatic stress fractures of the distal and proximal tibia, calcaneus, talus, and metatarsals in patients treated with methotrexate. Discontinuation of methotrexate is critical for bone healing. Due to the rarity of methotrexate osteopathy, the optimal treatment approach is not entirely clear. Case studies have demonstrated accelerated healing with the osteoanabolic drug teriparatide.

P991

NATIONWIDE INSIGHTS FROM 608 ORTHOPEDICIANS: EMPHASIZING PEAK BONE MASS, FRACTURE PREVENTION, AND EARLY SUPPLEMENTATION IN BONE HEALTH OPTIMIZATION

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Introduction

Optimal Peak Bone Mass (PBM) is critical for bone health, yet awareness and practices vary. The CARE-BONE survey aimed to assess orthopedic perspectives and identify gaps in PBM optimization across India.

Methods

608 orthopaedic were engaged in a nationwide, pan-India mapping exercise to comprehensively understand the importance of optimal peak bone mass in orthopedic practice. Conducted via a secure digital platform from the survey ensured data integrity and confidentiality. Participants rated 7 key therapy-related statements on a 5-point Likert scale. Statistical analysis, performed using GraphPad 10.4.1, defined strong consensus as a weighted score above 100.

Results

The mean experience was 16 ± 12 years (95% CI 15 to 17). The cumulative man-years of experience were 9447 years. The survey highlighted the critical importance of optimizing PBM in orthopedic practice. The highest weighted scores emphasized PBM's role in fracture prevention (120.0) and the long-term benefits of Vitamin D supplementation (118.5). There was broad consensus on the significance of early calcium and Vitamin B supplementation for fracture healing (117.2) and the importance of acquiring PBM in respondents under 30 years (117.1). While calcium supplementation in ages 25-30 (108.9) and preventive strategies for osteoporosis (112.9) showed slight variability, the overall findings highlight PBM as a cornerstone of bone health. Awareness levels among the younger generation revealed gaps, with 52.8% showing low awareness and only 5.92% demonstrating high awareness. The overall mean response scores were: Strongly agree: 61±39.4 (95% CI 51 to 71), Agree: 53±4.9 (95% CI 48 to 58), p<0.0001

Discussion

The CARE-BONE survey emphasizes the critical role of Peak Bone Mass in fracture prevention and bone health, with strong consensus on early calcium and Vitamin D supplementation, especially in individuals under 30. Variability in responses regarding supplementation in ages 25-30 highlights the need for standardized guidelines. Over half of younger orthopedicians showed low PBM awareness, that highlights the need for targeted educational initiatives. These findings reaffirm PBM as a cornerstone of orthopedic care, urging further research and policy interventions.

P992

BONE MINERAL DENSITY AND DISEASE DURATION IN PATIENTS WITH RHEUMATOID ARTHRITIS: INSIGHTS FROM A SINGLE-CENTRE STUDY

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Objective:

Osteoporosis is a common comorbidity in patients with rheumatoid arthritis (RA), and its prevalence increases with age. RA, a chronic inflammatory autoimmune disease, accelerates bone loss through both inflammatory mechanisms and the prolonged use of therapy, which are commonly prescribed to manage disease activity. The risk of osteoporosis in RA patients is further compounded by the duration of the disease, with older individuals being particularly vulnerable. Age-related changes in bone metabolism, combined with the inflammatory processes of RA, result in a higher likelihood of reduced bone mineral density. The

study aims to define the correlation between osteoporosis and the duration of diseases related to the age of rheumatoid arthritis patients.
Material and Methods:
The sample for the work consisted of consecutive patients meeting RA criteria treated at the in-patient department of the Rheumatology Clinic. The sample size was 100 subjects, which, in addition to the general characteristics, also analyzes bone mineral density results at the beginning of hospitalization and, after six months, presented as a standardized T-score. The statistical analysis was done for parametric data, a T-test was performed, and the Pearson correlation was used to confirm the relationship between parameters.
Results:
The average age of the sample analyzed was 50.9±5.7 years, with an average RA disease long-lasting 7.8±3.4 years. During the correlation between the T-score and age of the study population and the duration of the disease from diagnosis, respectively, a low positive correlation was gained (r=0.2). There is an evident significant difference among T-score values at the time of admission (before) and after six months of treatments (p= 0.000446).
Conclusion:
Based on the diagnostic values T-score, osteoporosis was more evident in older patients with RA who had a longer duration of the disease. Proper evidence-based treatment is crucial for ameliorating disease and improving bone mineral density results. Detailed projects should be designed for the future with a larger sample size to study other possible factors that could affect bone density, such as glucocorticoids, lifestyle, and quality of life.
Key words: rheumatoid arthritis, osteoporosis, age

P993

DOMAINS OF SENILE ASTHENIA SYNDROME IN PATIENTS WITH CHRONIC HEART FAILURE

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Objective: Systematize domains of senile asthenia syndrome in patients with chronic heart failure (CHF).
Methods: 120 patients over 75 years old are included, hospitalized in a hospital with CHF decompensation (tightness of shortness of breath, heartbeat, edema on the limbs).
To evaluate the SSA, a questionnaire "Age is not a hindrance" was used. The clinical domain (Charleson index, NYHA, a power scales), functional domain (Bartel Index), psychocognitive domain (Montreal Cognitive Assessment - MoCA, geriatric scale of depression), social domain (family status, housing conditions, education).
Results: Senile asthenia was observed in 58.3% (n=70) of hospitalized patients of senile age with asthenia syndrome, preiasthenia in 39.1% (n=47). Median (IQR) of age amounted to 79.85 [77.0-80.7] year, 70.8 % (n=85) women. Clinical domain: patients were characterized by high comorbits (Charleson index - 8.6±1.6 points) and high proportion of malnutricity 85.0% (n=102). In 85.8% (n=103) patients, III-IV functional class according to NYHA was observed. Functional domain: in 70.8% (n=85) patients, a complete/pronounced dependence on outside help was observed, which was more often observed with the accompanying syndrome of senile asthenia than in patients without senile asthenia – 65.9% against 29.7%, p <0.05, respectively. Psychocognitive domain: cognitive disorders were observed in 81.6% (n=98) patients (the average MoCA score – 15.5±3.7).
Heavier cognitive dysfunction was observed with senile asthenia syndrome than without senile asthenia - 13.3±4.2 versus 17.9±4.7, p<0.05, respectively. In 81.6% (n = 98) of patients, depression was noted. Social domain: 49% (n=78) patients live only 4.16% (n=5) - in the nursing home. 55.8% (n=67) patients are not married, 64.2% (n=77) have secondary education, 35.8% (n=43) - higher. When conducting logistics regression, the most significant predictors of senile asthenia (SSA) were: III–IV functional class according to NYHA (OR 5.4, 95% CI 1.4–21.7, p<0.05), expressed/complete dependence From outside help (OR 4.5-94 % CI 2.0-10.8, p<0.05), each MoCA score reduced the likelihood of senile asthenia of the senile asthenia syndrome by 10%.
Conclusion: The domain approach to patients with chronic heart failure is necessary for monitoring and optimizing pharmacotherapy and solving social issues.

P994

RISK FACTORS FOR REDUCING MINERAL BONE DENSITY IN PATIENTS WITH HODGKIN LYMPHOMA

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Hodgkin's lymphoma is an oncgetological disease in which osteoporosis often occurs. The development of osteoporosis is due to the influence of antitumor and adjuvant therapy. Currently, most algorithms for the diagnosis of osteoporosis are applicable to patients of older age groups. Important are timely diagnosis and prevention of osteoporosis in young patients with Hodgkin lymphoma.
Objective. To study the risk factors for reducing the mineral density of bone tissue, to develop an algorithm for early diagnosis in patients with Hodgkin lymphoma.
Methods. The study included 45 people with a diagnosis of Hodgkin lymphoma, each of whom signed an informed consent to participate in the study. Each of the patients took place of radiation and chemotherapeutic therapy.
22 people were included in the control group. All groups of patients were comparable by gender, age and anthropometric data. Each participant answered questions from the questionnaire "Risk Fracture Factors". All patients have been carried out densitometry and designed by the Z-criterion. The measurement of the mineral density of bone tissue was carried out in the area of the hip neck, the proximal thigh and the lumbar spine. Given the results obtained, we developed a methodology for the prevention of

osteoporosis in patients with Hodgkin lymphoma after radiation and chemotherapy.
Results. In patients with Hodgkin lymphoma, a significant decrease in the mineral density of bone tissue was revealed, mainly in the lumbar spine. Based on the survey data, we established the risk factors of osteoporosis: a low level of physical activity, a history of the hip neck, the forearm fractures, other history fractures, smoking, low body weight index, age, low calcium consumption, a history of parents, gender fractures, gender , removal of the ovaries. Given the results obtained, we developed a methodology for the prevention of osteoporosis in patients with Hodgkin lymphoma after radiation and chemotherapy. The prevention technique included therapeutic exercises, diet, intake of calcium preparations, prescribing drugs that restore the structure of bone tissue (antiresorbetic and anabolic drugs).
Conclusion. The methodology for the prevention of osteoporosis in patients with Hodgkin lymphoma after radiation and chemotherapy allows you to reduce the frequency of fractures.

P995

ASSESSMENT OF SARCOPENIA, ASTHENIA AND LIVER ENCEPHALOPATHY IN PATIENTS WITH CIRRHOSIS BEFORE AND AFTER LIVER TRANSPLANTATION

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Sarcopenia and liver encephalopathy - frequent complications of cirrhosis of the liver, are predictors of adverse prognosis in patients with cirrhosis. Liver transplantation is the main treatment for the terminal stage of liver disease.
Objective. Assess the presence and severity of sarcopenia, asthenia and liver encephalopathy in patients with cirrhosis of the liver before and after liver transplantation.
Methods. The study included 47 patients with liver transplantation included in the liver transplantation sheet and 20 patients after liver transplantation (7 months after the liver transplantation). The average age of patients before liver transplantation was 57.1±1.7 years, after the liver transplantation - 48.8±3.4 years. The patients were distributed as follows: before the liver transplantation of women - 32 (68%), men - 15 (32%); after the liver transplantation of men and women, 50%. The severity of the liver cirrhosis was estimated by Child-Pugh index: class A – 17 (36.2%) patients, class B – 8 (17%), class C – 22 (46.6%). The average score for the model of assessing the final stage of the Meld liver disease is 15.0. The muscle mass was evaluated by the measurement of the circumference of the shoulder, the muscle force- with dynamometry, to identify the degree of asthenia, Liver Frailty Index (LFI) was used, West-Haven criteria were used to determine the stage of liver encephalopathy, the number of numbers was used, the level of ammonium of capillary blood.
Results. In a group of patients with cirrhosis of the liver before the liver transplantation, the average value of the shoulder circumference was 26 [24; 29] cm, the average compression force of the hand is 20.4 [17.7; 23,1] kg. The average value of the LFI index was 4.11 [3.47; 4.75], which corresponds to the definition of "Pre-FRIIL". According to West-Haven criteria, 22 (46.8%) patients with cirrhosis of the liver had liver encephalopathy: the minimum-11 (23.4%), I stage - 5 (10.6%), II stage - 6 (12.4%), the average value of the number of the number of numbers was 75 [45; 105] sec, blood ammonium level was 99.5 [68; 131] μmol/l. In the group after transplantation, there was no statistically significant difference compared to the group to transplantation by the value of the circumference of the shoulder (25.6 [24; 27.3] cm, p>0.05), the average compression power (19.85 [19.85 [19.85 [16.01; 23.7 kg, p>0.05), the value of the LFI index (3.84 [3.47; 4,22], p>0.05), the time of execution of the number of numbers [30; 71] secμ, p>0.05). The level of ammonium after transplantation was significantly lower than in the group before transplantation (44.5 [34; 55] and 102.5 [71; 134] μmol/l (p<0.05).
Conclusion. 7 months after the liver transplantation in patients with cirrhosis of the liver, we did not establish changes in sarcopenia, asthenia and liver encephalopathy.

P996

LONG-TERM INTAKE OF GLUCOCORTICOIDS BY PATIENTS WITH RHEUMATOID ARTHRITIS: FOCUS FOR COMPLICATIONS

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Objective. The use of glucocorticoids in the treatment of patients with rheumatoid arthritis is widespread both in Russia and around the world. However, the duration and dose regime of glucocorticoids often go beyond clinical recommendations. Therefore, the study of the consequences of prolonged use of glucocorticoids in the treatment of rheumatoid arthritis becomes very relevant.
Methods. Of the 80 patients with the activity of the RA (ACR/EULAR of 2010), hospitalized in the rheumatological department of the city hospital in 2020–2023, 2 groups of patients were identified: the first – patients with rheumatoid arthritis who use systemic glucocorticoids for more than 6 months. (n=50): the duration of the intake of glucocorticoids 48 [27:79] month, the average dose of prednisolone at the time of inclusion in the study: 6.5±4.5 mg/day. The second group is patients with RA without the experience of taking glucocorticoids (n=30). To assess the profile of concomitant pathology, a cumulative index of diseases (CIRS) was used.
Results. The age of patients in the first group is 45.1±10.2 years (p<0.0001), in the second group 39.7±11.5 years (p <0.0001), the duration of the disease in the first group 16.1±8,4 years (p=0.0003); In the second group 7.5±5.7 years (p=0.0004).
In patients with rheumatoid arthritis of the first group III-IV, radiological stages were found in 34.8% of cases; in the second group – 16.2%; OR=1.5 [1.1; 2.1], p=0.02).

The frequency of the Difficult-to-Treat variant of rheumatoid arthritis (EULAR 2021) in the first group was 11.2%; in the second group – 5.3%, OR=2 [1; 2.7], p = 0.027). At the same time, the activity of rheumatoid arthritis in DAS28 at the time of inclusion in the study in groups was comparable (the first group: 5.2 [4.5; 5.9]; second group: 4.7 [4.3; 5.1]).
Therapy of rheumatoid arthritis in the first group was characterized by a large number of used basic anti-inflammatory drugs (first group: 2.7±1.2; second group: 2.4±0.7, p=0.0003), more frequent development of methotrexate-induced hepatitis (the first group is 14.5%; the second group is 12.1%; OR=1.55 [1; 2.5], p=0.039).
In the first group, the time interval between the debut of the rheumatoid arthritis and the initiation of biological therapy was larger – 10 [2; 18] years), in the second group – 7 [3; 11] years, p=0.0001) and directly correlated with the duration of glucocorticoid therapy (r=0.27) with a comparable qualitative structure of the used genetic and engineering biological drugs. In the first group, tuberculosis, hypertension, chronic kidney, cataract, osteoporosis (p<0.043) and its complications with a comparable frequency of cardiovascular diseases, diabetes, and gastrointestinal lesions were diagnosed. The first group revealed a higher Cumulative Illness Rating Scale (CIRS) index, and the CIRS severity index was lower than in the second group (p <0.05).
Conclusions. Long-term use of glucocorticoids lengthened the time to the prescription of genetically engineering biological drugs and was accompanied by an increase in multilomorbid load.

P997

HEALTH IMPACT ASSESSMENT OF THE SECONDARY FRACTURE PREVENTION PROGRAM AT THE HOSPITAL DE SAN JOSÉ DE BOGOTÁ

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Objectives: To describe clinic and sociodemographic characteristics, treatment, initiation and continuation of treatment, falls, disability and factors associated with refractures and mortality after 1 year of follow-up of patients admitted to the Secondary Fracture Prevention Program at the Hospital San José in Bogota Colombia since 2022 until October 2023.

Material and Methods: Retrospective cohort study carried out in hospitalized patients with fragility fractures admitted to the Fracture Liason Service (FLS) named Secondary Fracture Prevention Program at the Hospital San José in Bogota-Colombia between January 2022 and October 2023 who completed a one-year follow-up. Variables were analized at 3, 6 and 12 months after the fracture ocurred accoding to Key Performance Indicators (KPI) established by Capture the Fracture Program of the International Osteoporosis Foundation (IOF).

Results: 137 patients with one year follow-up were included (74,4% women) with a median of age of 78,5 years. Regarding the fracture site: 71%, 7%,10%, 9% and 3% were in hip, vertebra, ratio, humerus and other respectively. 94% of patients received indications to start pharmacological management prior to discharge of which, 32,8% started the treatment and only 24,8% were under treatment 12 months postfracture. In 20.4%, telephone follow-up was not carried out. Mortality rate was 17.5%.

Discussion: The FLS are intended to treat osteoporosis, prevent falls and thus avoid subsequent fractures and associated mortality. According to the KPIs to rate the performance of an FLS, it was found that a new fall was present in 5,8% and a new fracture in 7,2% of patients, disability was present in 45,2% during one-year of follow up. Mortality was associated with lower 25OHvitamin D levels 15,56 vs 25,46 (p=0.002). Refracture was associated with lower total hip T-Score -2.59 vs -1.86 (p= 0.046).

Conclusions:
There are multiple limitations in telephone follow-up of patients. Despite having indications to start treatment, there is difficulty in carrying out the administrative procedures required to start and continue therapy. This represents a wake-up call for the health system to reduce follow-up access barriers and reduce refractures and mortality.

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P998

HYPOPHOSPHATASIA, A CASE REPORT AND EXPERIENCE WITH THE START OF TREATMENT IN AN ADULT

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Objective

To describe a case of hypophosphatasia (HPP), the diagnostic challenge, response
and the difficulties with the initiation of treatment with asfotase alfa.

Material and Methods

The data were collected from clinical history with the patient's authorization and a review of the literature was carried out with the key words: hypophosphatasia, adults, asfotase.

Results

39-year-old woman of short stature, product of consanguineous parents. Complete tooth loss since 10-years-old, multiple fractures in lower and upper limbs, severe mobility limitations confining her to a wheelchair, generalized pain and evidence of bone deformities in extremities. WOMAC-score showed: Pain 15, stiffness 4 and functionality 61. Laboratory tests showed slightly elevated serum calcium and phosphorus levels, normal PTH, 25OHvitamin D and phosphaturia. Nutritional deficiency or metabolic causes were ruled out. X-rays of long bones showed nonunion fractures, osteomalacia signs and rickets deformities in the extremities. Severely diminished alkaline phosphatase (ALP) was found (<10 IU/L) in three separate measurements. A diagnosis of HPP was made. Measurement of ALP substrates, genetic studies and counseling were requested to identify mutation of the ALPL gene (not essential for diagnosis) and treatment with asfotase alfa was started; with just one dose the bone pain has improved.

Discussion

HPP is an orphan disease, with autosomal dominant or recessive inheritance mechanism, secondary to pathogenic variants in the ALPL gene that lead to decreased non-tissue-specific ALP activity, allowing adequate bone mineralization. Asfotase alfa is a recombinant ALP approved in Colombia for hypophosphatasia in children. In adults, this indication is off label, however adults with HPP who received asfotase alfa for ≥ 6 months experienced improvements in mobility, physical function, and HRQoL.

Conclusions:

Low diagnostic suspicion and difficult recognition by medical personnel generate an under diagnosis of HPP. Its consequences on bone health have an impact on the patient's functionality and quality of life. Its treatment is expensive, with approval in Colombia only for pediatric cases, which makes it difficult to obtain, start and maintain.

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P999

SEVERE IDIOPATHIC OSTEOPOROSIS IN A YOUNG PATIENT

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Osteoporosis is often associated with aging but the condition can also affect younger.

This case report describes 49-year-old patient, with a medical history of the following conditions: idiopathic osteoporosis (2016), Helicobacter pylori-positive gastritis (2005), perforated acute cholecystitis (2021), anxious-depressive disorder with a psychotic episode (2021), SARS-CoV-2 infection (2020), and mixed dyslipidemia, presents with the following clinical findings on physical examination: pronounced dorsal kyphosis and muscle contracture in the lumbar region.The family medical history is notable for Charcot-Marie-Tooth disease in the mother and sister.

Investigations conducted to exclude secondary causes of osteoporosis reveal normal renal function, euthyroidism, normal cortisol levels, normal serum testosterone, normal calcium and parathyroid hormone levels, and normal alkaline phosphatase. In light of these findings, the diagnosis of idiopathic osteoporosis is established.

The patient was initially treated with Alendronate sodium and Colecallciferol, which was discontinued due to gastric issues, and subsequently continued with Denosumab (1 injection every 6 months), along with Vitamin D3 (2000 IU daily), and Calcium citrate with Vitamine D3 (1 tablet daily for 2 weeks), for a total duration of 46 months.

In June 2024, a decision was made to discontinue Denosumab treatment and continue with Vitamin D supplementation alone.

Z-Score

Year	Lumbar spine	Right hip	Left hip
2016	-3,5	-2,6	-2,0
2017	-3,9	-2,5	-2,2
2020	-3,3	-2,4	-2,1
2021	-3,3	-2,0	-1,9
2022	-3,0	-2,0	-1,8
2023	-2,7	-1,8	-1,2
2024	-2,4	-1,9	-1,2

Bone densitometry confirms significantly decreased bone mineral density for the patient's age.The Lumbar spine TBS is 1.219 which suggests a degraded microarchitecture compared to reference population.
Conclusion The importance of investigating and treating osteoporosis in young men, even in the absence of an obvious etiology, is underscored.

P1000

YOUNG FEMALE PATIENT WITH INACTIVITY OSTEOPOROSIS AFTER SPINAL CORD INJURY(SCI)

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The consequences of immobilisation-induced bone loss are significant, as they not only heighten the risk of fractures but also contribute to functional limitations, longer recovery times, and poorer overall health outcomes.
Objectives
This case report describes 27-year-old patient, with a medical history of the following conditions: T7 - T8 vertebro-medullar trauma (SCI) due to road traffic accident (12.09.2020) operated (17.09.2020 - T7 laminectomy - anterior decompression with bilateral metalic synthesis), minor cranio-cerebral trauma, inactivity-related Osteoporosis (2022),presents with the following: paraplegic-type motor deficit, sphincter disorders, ADL deficit.

Materials and methods
The John Hopkins Health System Corporation scale shows a high risk of falling (16 points). Also, the calculated Barthel Index shows a severe degree of dependency (35 points out of 100), and the Functional Ambulation Categories scale indicates that the patient falls into the non-functional ambulatory category. The patient is treated with Vitamin D3 (1mg daily).

	Place of measurement	BMD (g/cm²)	Z Score
2022	Right hip	0,636	-2,8
	Left hip	0,608	-3,0
	Spinal cord	0,995	-0,5
2025	Right hip	0,620	-2,9
	Left hip	0,602	-3,2
	Spinal cord	0,890	-1,5

Results
The progression of osteoporosis is evident, with continued loss of bone mass.

Conclusion
Understanding the unique challenges that young individuals face when immobilised is crucial for improving clinical outcomes and supporting the development of preventive strategies that preserve bone integrity throughout life.

P1001

ROMOSOZUMAB: ANALYSIS OF SAFETY AND DIFFERENTIAL EFFECTIVENESS IN SPECIFIC SUBGROUPS: PATIENTS WITH RHEUMATOID ARTHRITIS, DIABETES MELLITUS (DM), CORTICOSTEROIDS-INDUCED OSTEOPOROSIS

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Background/Objective: There is limited evidence regarding the effects of 12 months of romosozumab (ROMO) treatment on increasing bone mineral density (BMD) in real-world clinical practice due to its recent approval. This study aimed to describe the effectiveness and safety outcomes of ROMO at 12 months in patients at very high risk of fracture and to investigate its differential effectiveness in specific subgroups: patients with rheumatoid arthritis (RA), diabetes mellitus (DM), corticosteroid-induced osteoporosis, and those who are treatment naive for osteoporosis.
Methods: In this prospective, observational, and multicenter study, data were analyzed for 216 female patients, with baseline and follow-up bone mineral density (BMD) information available for 74 patients. Collected characteristics included osteoporosis (OP) risk factors, cardiovascular risk factors (CVRF), DM, diseas-

es requiring glucocorticoids (GC), RA, and BMD measurements before and after ROMO treatment. Additional data on previous treatments and safety outcomes, including major adverse cardiovascular events (MACE), were collected at 6 and 12 months (Table 1) .

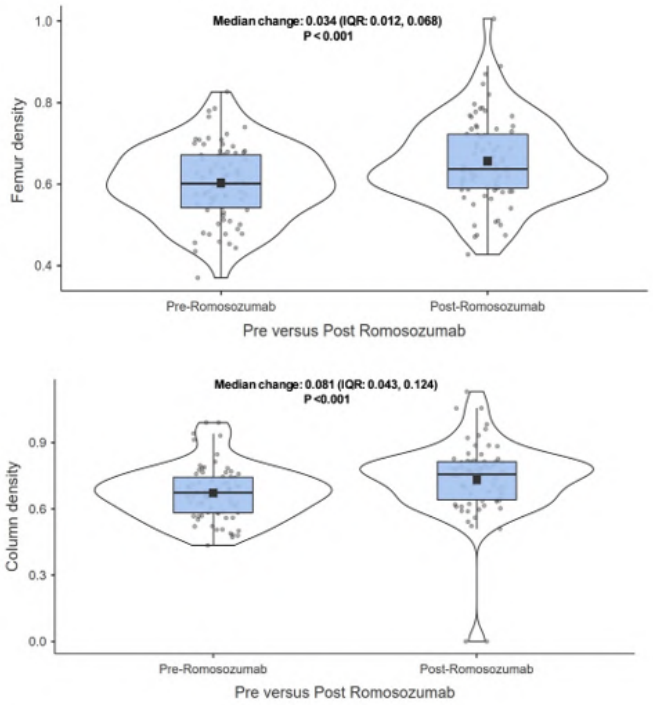
Results: There was a statistically significant increase in column density (8.76%), which was also maintained across all prespecified subgroups, except for the DM subgroup, which showed only a 3.88% increase. Similarly, femur density increased significantly (5.65%), with this improvement observed in all prespecified subgroups except the DM subgroup, where the median increase was 1.65% (Figure 1).
No MACE were documented at 6 months or 1 year. Fourteen patients discontinued treatment, with 11 cases attributed to adverse events, 1 to economic reasons, 1 due to uncertainty about the treatment, and 1 as a result of multidrug use. Adverse events included depression (n=1), headache (n=1), drug intolerance (n=6), flu-like symptoms (n=1), osteonecrosis of the jaw (n=1), and cramps (n=1).

Conclusion: This real-world dataset demonstrates rapid progress after one year of treatment, with significant increases in BMD observed in both the lumbar spine and femoral neck. All analyzed subgroups showed a significant increase in BMD, except for patients with DM. Further studies are needed to evaluate the effect of ROMO on BMD changes in patients with unique characteristics.

Table 1: Demographic characteristics and baseline clinical data.

Parameter		N: patients. (%)
Females, n (%)		216 (100)
Age (years), mean (SD)		69.3 (8.55)
Smoking status, n (%)	Current smokers	30 (14.12)
	Ex-smokers	11 (5.2)
Alcohol use, n (%)	Current users	62 (32%)
	Ex-users	1 (0.5%)
Dyslipidemia, n (%)		85 (40.3)
Endocrinopathy, n (%)	DM	37 (19.1)
	Thyroidopathy	7 (3.6)
	Thyroidopathy + DM	2 (1)
Rheumatisms, n (%)	Rheumatoid arthritis	57 (29.4)
	Connectivopathy	2 (1)
	Spondyloarthropathy	1 (0.5)
	Polymyalgia	4 (2.1)
Early menopause, n (%)		39 (20.2)
Prior hip fracture, n (%)		73 (34.8)
Prior Vertebral fracture, n (%)		167 (79.1)
Other fractures, n (%)		52 (33.8)
Per case vertebral fracture, median (Q1, Q3)		2 (0.5, 3)
Vitamin D level (nmol/L) median (Q1, Q3)		34 (27, 45)
Glomerular filtration rate (mL/min/1.73m2), median (Q1, Q3)		87.58 (75.2, 90)
FRAX Total score, median (Q1, Q3)		19(11, 28)
FRAXcad score, median (Q1, Q3)		6.4 (2.8, 12)
Prior PPIs, n (%)		67 (39.4)
Prior SSRIs, n (%)		50 (25.9)
Prior Corticosteroids		24 (17.5)
Prior denosumab treatment, n (%)		58 (50.5)
Prior bisphosphonates treatment, n (%)		104 (53.6)
Prior teriparatide treatment, n (%)		86 (34.3)
Prior calcium and Vitamin D treatment, n (%)		128 (93.4)

Figure 1. BMD measures baseline, follow-up,



P1002

THE EFFICACY OF FOCUS EXTRACORPOREAL SHOCK WAVE THERAPY ON HAMSTRING TIGHTNESS IN HEALTHY SUBJECTS

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Objective: To study efficacy of focus extracorporeal shock wave therapy on the flexibility of hamstring muscles in healthy subjects
Study design: Double-blind randomized controlled trial (RCT)
Setting: Rehabilitation Medicine Department, Faculty of Medicine Ramathibodi hospital.
Subjects: Healthy subjects age between 18-65 years with limited hamstring flexibility
Methods: All participants were evaluated by passive knee extension test (PKE) to define the limited hamstring flexibility and later received weekly focus extracorporeal shockwave therapy (F-ESWT) at energy flux density 0.15 mJ/mm^2, frequency of 6 Hz, intensity, 2,000 pulses per session, 1 session per week for 3 weeks) compared with sham F-ESWT. Both groups also received standard static stretching home exercise program. Passive knee extension (PKE), Back-saver sit-and-reach test (BSSR), Sit and reach test

(SRT) and Toe touch test (TT) were evaluated before and 1, 2 and 3 weeks after intervention.

Results: One hundred and twenty-four participants with mean age (SD) of 37.44(12.60) were recruited by randomized controlled males and females equally. At pre- intervention, mean passive knee extension test (PKE) (SD) was 29.22(7.65) and median Back-saver sit-and-reach test (BSSR), Sit and reach test (SRT) and Toe touch test (TT) were -6.2 (-28.60,15.60) cm, -4.90(-27.60,13.70) cm and -5.40(-25.50,8.10) cm, respectively. When comparing between pre-, 1, 2 and 3 weeks post- intervention, the PKE, BSSR, SRT and TT improved significantly in both groups (P<0.05). Even though more improvement in F-ESWT group, there was no statistic significant; except TT (P=0.014)

Conclusion: F-ESWT with home exercise program for flexibility of hamstring muscle is effective in improving the flexibility of hamstring muscles in healthy subjects, but did not provide additional improvement compared with performing standard static stretching alone especially in mild degree of hamstring inflexibility subjects.

Keywords: Focus ESWT, hamstring flexibility, hamstring tightness

P1004

ASSESSING THE RISK OF OSTEOPOROSIS AND FRAGILITY FRACTURES IN THE COMMUNITY: IN THE WORLD OSTEOPOROSIS DAY CAMPAIGN

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Objective:

Osteoporosis is one of the most common chronic diseases among the elderly. It is characterized by an increased risk of severe fractures, reduced quality of life, and substantial economic costs. This abstract reports on osteoporosis risk assessment within a national osteoporosis campaign held by the Osteoporosis Research Center and Non-Communicable Disease Office of the Iran Ministry of Health and Municipality.

Material and Methods:

This descriptive study was conducted in the public seminars. Data were collected using the Osteoporosis Risk Check tool from the International Osteoporosis Foundation (IOF). The tool contains ten yes-no questions to assess risk factors for osteoporosis such as age, history of fractures, low body mass index (BMI), height loss of more than 4 cm, and comorbidities. A "yes" answer to any item indicates an increased risk of fractures or osteoporosis. The target population was the general public, who participated in public seminars held in neighborhood halls and health centers. Data were collected before participants entered the seminar. In these three-hour seminars, experienced professors provided information on bone health, osteoporosis, risk factors, fall and fracture prevention, and lifestyle modification. The seminar ended with a question-and-answer session. Data were analyzed with SPSS software using chi-square analysis.

Results

A total of 1,101 individuals participated in the study, of whom 81% were women, 21.8% were over 60, and 56.1% had education levels above high school. Among the participants, 52.6% responded positively to at least one question on the risk check, indicating they were at risk for osteoporosis. About 82% reported familiarity with osteoporosis, but only 20.1% of participants sought a diagnosis and had a bone density test. Additionally, 41.1% of those diagnosed with osteoporosis were currently taking medication, and 78.4% were adhered to their treatment regimens. Also, of those over 60, 3.7% had fractures after age 50, 2.8% had a BMI below 19, and 5.8% had a height reduction of over 4 cm after age 40.

Conclusion

The findings indicate that preventive awareness and diagnostic measures for osteoporosis persist inadequately. Expanding educational campaigns and national screening programs are crucial to improving bone health in the population.

Keywords: Osteoporosis, Risk check, Fragility fracture, Iran

P1005

INFORMING AND EDUCATING ABOUT OSTEOPOROSIS AT THE COMMUNITY LEVEL: IN THE WORLD OSTEOPOROSIS DAY CAMPAIGN

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Objective: Osteoporosis, as a common bone metabolic disorder, leads to fracture and causes significant morbidity and mortality. However, there is a substantial knowledge gap regarding risk factors and prevention strategies. This abstract reports on osteoporosis awareness status within a national osteoporosis campaign held by the Osteoporosis Research Center, the Non-Communicable Disease Office of the Iran Ministry of Health, and the Iranian Osteoporosis Society.

Material and Methods:

This descriptive study was conducted during awareness campaigns and educational programs, including community-based seminars. These public seminars (October and November 2024) focused on raising awareness through lectures, interactive activities, and expert Q&A sessions.

The target population was the general public, who participated in public seminars held in neighborhood halls and health centers. In these three-hour seminars, experienced professors provided information on bone health, osteoporosis, risk factors, fall and fracture prevention, and lifestyle modification. The seminar ended with a question-and-answer session. Data were collected using a validated questionnaire before participants entered the seminar. The awareness score was categorized according to total value:80% or higher indicates good awareness, between 50% and 80% signifies moderate awareness, and a score below 50% reflects poor awareness. Data were analyzed with SPSS software using chi-square analysis.

Results:

A total of 261 participants attended the seminars. In total, 96.2% were women, with a mean age of 48.86 years. Findings revealed that 15.7% of participants showed a poor level of awareness, 79.5% moderate awareness, and only 4.8% demonstrated good awareness levels. Knowledge about risk factors, such as Calcium and vitamin D deficiency, lack of dietary intake, and smoking, was acceptable, but misconceptions regarding the role of coffee intake and frailty existed. Higher educational attainment was significantly associated with better awareness levels (P >0.021).

Conclusion:

The study underlines the need for comprehensive and targeted educational interventions. Innovative communication strategies and culturally adapted content can effectively improve public awareness and prevention of osteoporosis. Stainable efforts, especially among at-risk groups, are essential to mitigate the disease's burden.

Keywords: Osteoporosis awareness, Education, Iran

P1006

THE FRENCH VERSION OF PHYSICAL ACTIVITY SCALE FOR THE ELDERLY (PASE) – TRANSLATION, CULTURAL ADAPTATION AND VALIDATION

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Objective: To translate the Physical Activity Scale for the Elderly (PASE) questionnaire into French, adapt it to the French European culture and validate it.

Material and methods: The PASE was translated and culturally adapted using a 5-step validated process. The investigation of the measurement properties included the internal consistency, test-retest reliability, construct validity and floor and ceiling effects.

Results: The translation faced no major problems, with moderate cultural adjustments. Unfamiliar activities such as American football, shuffleboard or aerobic dancing were adjusted, while common sports like yoga, aqua cycling and electric cycling were added. Validation study involved 89 older participants (median age of 73 (69.5 - 77) years, 58% of women). Moderate internal consistency was found (Cronbach's alpha= 0.571). Test-retest reliability was very good for household activities (ICC= 0.712 (95% CI= 0.496 – 0.845)) and work-related activities (ICC= 0.955 (95% CI= 0.908 – 0.978)) but was lower in the leisure section (ICC= 0.163 (95% CI= - 0.183 - 0.473)), leading to a moderate overall score (ICC= 0.455 (95% CI= 0.125 - 0.608)). This result could be attributed to the weather conditions that were not similar between the two test-intervals[1], which affects leisure activities (most of which take place outdoors)[2]. Construct validity was almost confirmed (66.67% of the ideal 75% hypothesis was validated). No floor or ceiling effects were detected.

Conclusion: The French PASE appears to be a reliable and relatively valid tool for assessing household and work-related activities. However, PASE should be used with caution, especially when assessing leisure time activities, ensuring that the meteorological conditions are consistent between the two reliability tests.

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P1007

ASSOCIATIONS BETWEEN THE LIVING ENVIRONMENT AND SLEEP THROUGH THE MEDIATION OF THE PHYSICAL ACTIVITY: A SYSTEMATIC REVIEW PROTOCOL

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Objective: To obtain a comprehensive understanding of the role of physical activity as a mediator variable in the association between the living environment and sleep.
Material and methods: The systematic review protocol has been published on PROSPERO [ID: CRD42024580376]. The PRISMA 2020 guidelines will be followed throughout the process. This systematic review will include both experimental and observational studies in English that focus on how physical activity mediates the relationship between the living environment and sleep in humans, regardless of age, gender or ethnicity. The literature search will be conducted in Medline (via Pubmed), Scopus and Embase, using both controlled language and free text to formulate the search equations. Additional manual searches will also be realized. Studies will be imported into the Covidence software for duplicate removal, and selection will be conducted by two independent reviewers based on titles, abstracts, and full-text articles, providing detailed reasons for exclusion. Data extraction will be performed independently by two reviewers, while the methodological quality of the studies will be assessed using the critical appraisal tools for use in JBI Systematic Reviews.
Results: We expected to obtain the results of the systematic review during 2025.
Conclusion: Identifying elements of the living environment that influence sleep through the mediation of physical activity is essential for public authorities to develop effective strategies in public health, housing, and territory planning. Highlighting the role of physical activity in this association can guide targeted interventions to improve both sleep health and, more broadly, overall health status.

P1008

TUMOUR INDUCED OSTEOMALACIA: ELEVATED SERUM FIBROBLAST GROWTH FACTOR 23 MAY A PREDICTOR FOR THE OCCURANCE OF FUTURE TUMOUR

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Background Tumour induced osteoporosis (TIO) is a rare paraneoplastic disease characterized by decreased renal tubular reabsorption of phosphate, by hypophosphatemia and by low levels of active vitamin D ultimately results in osteomalacia due to chronic hypophosphatemia. Diagnosis of TIO is usually suspected when serum phosphate levels are chronically low in the setting of bone pain, fragility fractures and muscle weakness. It is usually associated with high serum level of fibroblastic growth factor (23FGF23).
Case presentation
A 44 year age female presented with sever agonizing generalized bony aches mainly in the chest, dorsal and lumber spine, also she had gradual progressive muscle aching and weakness in the pelvic girdle with difficulty in walking, getting up from floor as well as shoulder girdle with difficulty in doing normal daily activities. All manifestations occurred and gradually increased after removal of left benign breast mass 3 month earlier. On examination; generally she look ill, suffers from pain and walks with waddling pattern. Neurological examination showed weakness in the shoulder and pelvic girdle muscles (power grade 3+) but no wasting with normal sensation and reflexes. Musculoskeletal examination revealed generalized polymyalgia, tenderness in dorsal and lumber spine, sacroiliac joints, most of the ribs. Also tenderness of the left shoulder joint with limited ROM for both Shoulders. Left knee and Right ankle sowed mild tenderness with full ROM. No Hotness or swelling for the examined joints. Laboratory investigations showed reduced total serum calcium 8.7 mg/dl while the ionized serum calcium was normal 4.12mg/dl , decreased serum phosphorous 1.3 mg/dl , elevation of serum alkaline phosphatase 482 u/l (normal range 35-105) and normal total CPK , serum PTH elevated 385.2 pg/ml and marked decrease in serum vitamin D level 5.16 ng/dl. CA 41.18 U/mL mildly elevated (normal level up to 37 U/mL) and CEA (Carcinoembryonic Antigen) was normal 0.72 (normal level up to 7 ng/ml). DEXA scan showed severe osteoporotic pattern (T score was - 4.1 at lumber spine, -2.9 femur and -2.2 at forearm). Whole body F18-FDG PET/CT report stated absence of any significant blastic/lytic lesions or dense tracer foci could be seen over the surveyed skeleton, but there was left dense left breast parenchyma with bad architecture distortion. She treated with calcitriol and phosphate supplements with gradual improvement. Six months later the patient complained of recurrent abdominal pain with recurrent melena Upper gastroscopy was normal but colonoscopy showed fungating mass proved to be adenocarcinoma of the colon. In conclusion and earning points for clinical practice: patient with high level of FGF23 with manifestation of TIO should be closely monitored and regularly followed up for future malignancy

P1009

ATYPICAL BILATERAL AFF

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Introduction: The aetiology of atypical femoral fractures (AFF) is multifactorial. Though the incidence is very low (1) The propensity for AFFs to be bilateral and in the same location on ipsilateral and contralateral sides suggests that femoral geometry may play a part in its incidence (2). We present a case here in which in our opinion, the geometry of femur was the sole risk factor.

Case Presentation: A 69-year-old active Caucasian woman presented with a fracture of shaft of left femur with all the radiological features of AFF (Fig.1), when she tripped over at home. She was treated with intra-medullary nailing (IMN). She had no obvious risk factors for osteoporosis and was never treated with any bisphosphonate or steroids. Her routine biochemistry including bone turnover markers was normal her BMD showed osteopenia. Though she did not complain of any pain in the contralateral thigh, an x-ray followed by a CT scan of right femur demonstrated a microfracture at almost the same position as the left AFF (Fig.2). She had preventative IMN. It was noticed that she had increased bowing specially in frontal plane(Angle A 13°) (Fig3).

Discussion: Femoral bowing is defined as the angle between two lines along the proximal and distal portions of the femoral shaft in both frontal (angle A) and sagittal plane (angle B) allowing for the quantification of both lateral and anterior bowing angles (3). Sasaki measured the angles in 24 normal controls and found the Angle A to be 4.6±5.1 and Angle B 11.8±3.8 (4)
It is hypothesized that geometry influences AFF risk by increasing mechanical strains at the femoral shaft (3) and these studies suggest that elevated femoral bowing may increase the risk of AFF independent of bisphosphonate exposure (5). A better understanding of how femoral geometry is linked to AFF may allow for clinical risk stratification for patients with osteoporosis on bisphosphonate treatment.

Fig.1

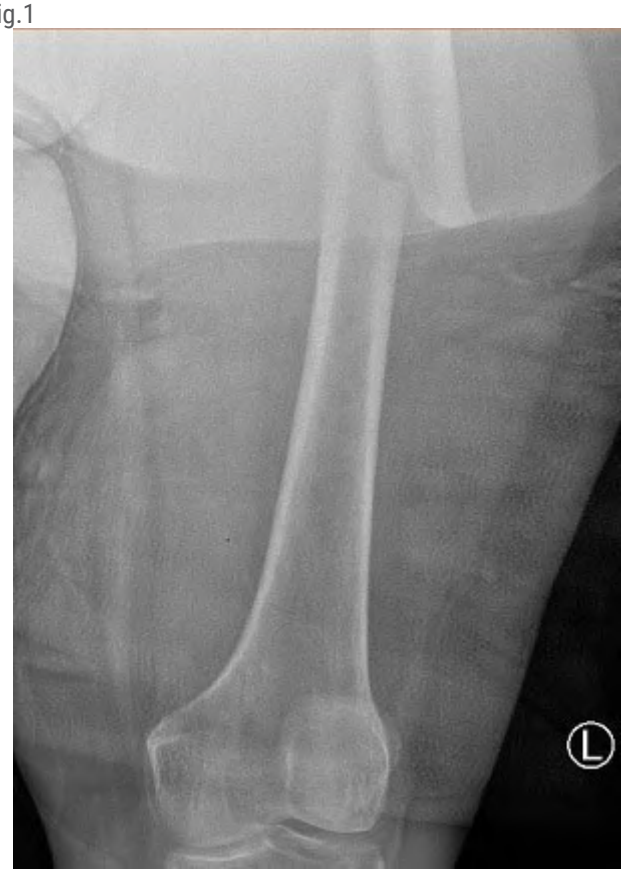


Fig.2

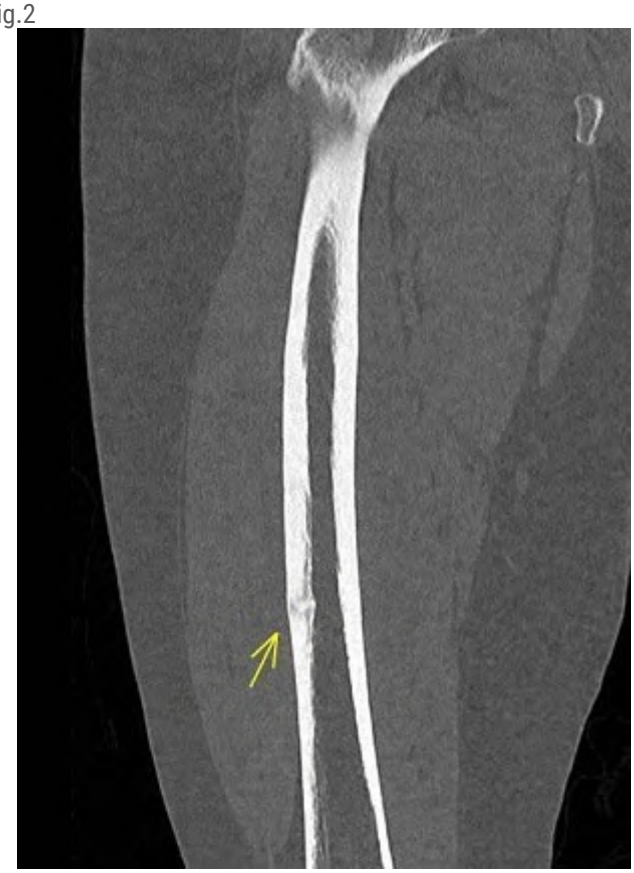
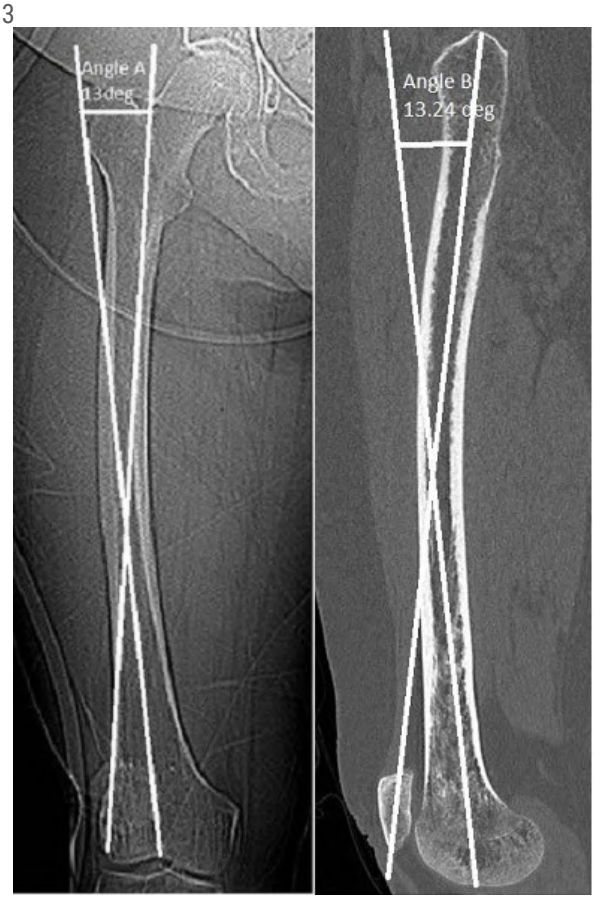


Fig.3



Frontal Sagittal

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P1012

EFFECTIVENESS OF ELECTROTHERAPY IN THE TREATMENT OF PAIN IN KNEE OSTEOARTHRITIS

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Objective : to evaluate the effectiveness of TENS in managing pain associated with knee osteoarthritis.
Methods :
A longitudinal study in the rheumatology department included patients diagnosed with knee osteoarthritis according to the 1986 ACR criteria (1).
Patients on non-steroidal anti-inflammatory drugs (NSAIDs), anti-arthritic drugs, those with knee prostheses, or those who had undergone viscosupplementation or corticosteroid injections within the past four months were excluded. Only paracetamol was allowed during the study. Socio-demographic and clinical data were collected.
Progression of responses was evaluated in the three domains of the WOMAC index: pain, stiffness, and function, comparing the period before (T0) and after (T1) the TENS sessions.
Subsequently, all recruited patients underwent a program of 9 sessions of TENS physiotherapy in the physical medicine department, with 3 sessions per week. Statistical analysis was performed using SPSS software.
Results :
Thirty patients with knee osteoarthritis were included in the study. The average age was 57.70 ± 16.37 years [22–87]. The sex ratio (M/F) was 1.3. Hypertension was found in 61%, 37% were diabetic, and 21% had dyslipidemia. The average body mass index (BMI) was 29.13 ± 3.91 kg/m² [22.40–36.70], with 43% being overweight and 33% obese.
The average duration of knee pain was 76.34 ± 131.53 months [6–720]. Genu-varum in 40%, genu-valgum in 27%, and genu-flexum in 7% of patients.
According to the Kellgren and Lawrence radiographic classification, 52.2% of the patients had moderate-stage knee osteoarthritis.
A significant improvement was observed in the WOMAC function domain, with scores decreasing from 386.33 at T0 to 314.33 at T1 ($p = 0.047$).
No significant improvement was noted in the WOMAC pain (T0: 167.87; T1: 142.67; $p = 0.116$), and stiffness (T0: 31.67; T1: 25.67; $p = 0.387$), and weekly paracetamol consumption (T0: 1.77; T1: 1.27; $p = 0.395$).
Conclusion: Our study confirms the widely proven effectiveness of TENS in alleviating osteoarthritic knee pain, and improving stiffness and function.
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P1013

A CASE OF SEVERE MALE OSTEOPOROSIS: 42-YEAR-OLD MAN WITH HIDRADENITIS SUPPURATIVA AND MULTIPLE VERTEBRAL COMPRESSION FRACTURES – DIAGNOSTIC AND THERAPEUTIC CHALLENGE

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Objective(s): Osteoporosis, characterized by low bone mass and microarchitectural deterioration of bone tissue, leading to fragility fractures, is the most common metabolic bone disease. However, the incidence of osteoporosis in young men is relatively low. Most cases in young adults are secondary (mostly glucocorticoid use), with less than 10% attributed to idiopathic causes. Treating osteoporosis in younger patients is challenging, and addressing the underlying etiology is crucial.
Material and Methods: This case report describes a 42-year-old male patient treated with adalimumab for hidradenitis suppurativa and spondyloarthritis. He was referred to our osteology outpatient clinic for vertebral compression fractures. The patient complained of back pain and was initially diagnosed with spondyloarthritis, despite being HLA-B27 negative. He was progressively shortening and reported no effect of adalimumab on his back pain. He denied glucocorticoid use and had no other known endocrinological disease.
Results: Initial evaluations - densitometry and X-ray imaging, confirmed osteoporosis and multiple vertebral fractures. Given the severity of the condition, we pursued genetic testing. Meanwhile, as mutation detecting is time-consuming, we opted to initiate anabolic therapy. As condition manifested in adulthood and without concomitant symptoms we excluded osteogenesis imperfecta and among others we suspected mutation of LRP5 gene, which would be resistant to teriparatide. Therefore we decided to start off-label romosozumab therapy. The drug was well tolerated and effective. For more we reconsidered diagnosis of spondyloarthritis - patient is not fulfilling diagnostic criteria.
Conclusion(s): In differential diagnostics of back pain in young male osteoporosis should be considered and densitometry should be performed. In case of detecting low bone density secondary causes, including genetic mutations, should be inves-

tigated. Taking on account young age and long life expectancy anabolic treatment should be the first choice to rebuild bone mass, afterwards antiresorptive drugs should be considered. **Acknowledgments:** Supported by the project (Ministry of Health, Czech Republic) for conceptual development of research organization 00023728 (Institute of Rheumatology)

P1014

THE EFFECTS OF TIBIA FRACTURE AND INJECTION OF MESENCHYMAL STEM CELLS INTO FRACTURE AREA ON CHEMICAL COMPOSITION OF DENTIN OF UPPER MOLARS

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Objective: Aim of the study is to test chemical composition of dentin of upper molars (DUM) after tibia fracture modeling and injection of mesenchymal stem cells (MSC) into the defect of the tibia at different times after surgery.
Material and Methods: 162 male rats with the body weight of 190-225 g were distributed into 7 groups: group 1 - controls, group 2 - animals with tibia fracture, and groups 3-7 animals with the same tibia fracture that received local injections of 5 million MSC per injection at 3rd, 10th, 15th, 24th and 45th days after surgery. Bone marrow cells were obtained from the tibia and phenotyped according to standard methods. Upon expiration of observation terms (7, 15, 30, 60 and 90 days) the animals were withdrawn from the experiment; DUM prepared for chemical analysis.
Results: In the group 2 calcium/phosphorus ratio in the DUM in the period from the 30th to the 90th day after surgery was lower than those of the group 1 by 6.37%, 8.21% and 7.38%, and calcium level by 60th day - by 3.87%. In the group 3 calcium/phosphorus ratio by 90th day were higher than those of the group 2 by 3.82%, and fluorine level by 60th and 90th day - by 5.29% and 4.49%. In the group 4 calcium/phosphorus ratio and fluorine level in the period from the 30th to the 90th day were higher than those of the group 2 by 5.25%, 7.48% and 6.77%, and by 6.12%, 6.76% and 4.92% respectively. In the group 5 calcium/phosphorus ratio in the period from the 30th to the 90th day was higher than those of the group 2 by 5.80%, 6.78% and 5.83%, and fluorine level by 60th and 90th day - by 4.91% and 4.92%. In the groups 6 and 7 the restoration of the chemical composition of DUM were expressed to a significantly lesser extent.
Conclusions: Administration MSC into the defect of the tibia at different times after surgery was accompanied by a faster recovery of the chemical composition of DUM. The most effective was administration of MSC on the 10th day after surgery.

P1015

APPLICATION OF MACHINE LEARNING AND ITS EFFECTS ON THE PREDICTION OF SARCOPENIA

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Objective: The study aimed to investigate the variety of Machine Learning (ML) methods and their ability to detect individuals at risk of or suffering from sarcopenia.
Material and Methods: A scoping review was performed. Pubmed databases were searched from July to September 2024 for trials related to the sarcopenia prognosis and artificial intelligence. The key words used were "sarcopenia", "artificial intelligence", "machine learning", "risk factors". All studies were able to identify sarcopenia with moderate to high accuracy values and with different ML methods. The reference lists of systematic review articles and meta-analyses were scanned for any additional references missed from the above databases' search. Only English literature was included for the current review.
Results: In total 11 articles were included. A total of 15.799 participants were included in this review. The machine learning methods that standout were, deep neural networks, LightGBM, Decision Tree, CAT, k-nearest neighbors. 4 studies were performed in Korea, 2 in Mexico, 1 in China, 1 in Italy, 1 in turkey, 1 in USA, and 1 study had data from participants from 3 different countries (England, Jamaica and Singapore). As for the risk factors it is found that the most important were age, body mass index, waist circumference, chronic diseases and some socioeconomic features.
Conclusion(s): These results indicate that ML methods can be used by clinicians for faster and more cost-effective means of identifying sarcopenia. Early and accurate detection of sarcopenia through ML can lead to timely interventions reducing several serious health issues. ML has emerged as a powerful tool in the field of healthcare, offering novel approaches to diagnosing and predicting conditions such as sarcopenia.
Keywords: sarcopenia, machine learning, risk factors

P1016

PREVALENCE AND ASSOCIATED FACTORS OF SARCOPENIA AMONG PATIENTS WITH HYPERTENSION

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Objective: To investigate the prevalence rate of sarcopenia and associated factors among older adults with hypertension.
Material and Methods: This was a cross-sectional study of 102 older patients with hypertension aged ≥60 years. Hypertension

was defined by self-reporting of a physician diagnosis or the use of antihypertensive medication. All participants were evaluated for sarcopenia using the European Working Group on Sarcopenia in Older People 2 (EWGSOP2) criteria. Reported determinants (sex, age, sociodemographic characteristics, chronic diseases, fall history) of the participants were obtained through a questionnaire. Anthropometric assessments were performed to measure the patients' weight, height and body mass index (BMI). Body composition was evaluated by bioimpedance analysis (Tanita BC-601). Handgrip strength (HGS) was assessed via a hand held dynamometer (Saehan, Seoul, Korea). Gait speed (4 meters test), and 5 times sit to stand test (5STST) were evaluated also. The association between variables was calculated using Pearson-r correlation coefficients.
Results: The overall prevalence of sarcopenia among older adults with hypertension was 24.5% (n=25). The mean age of the study population was 70.2 ± 5.6 years (age range, 60–93 years). Patients with sarcopenia were older than those without sarcopenia ($p \leq 0.001$). Patients with concurrent hypertension and sarcopenia had a significantly lower HGS, walking speed and a higher incidence of osteoporosis, and fall history ($p < 0.05$) compared to non sarcopenic older adults. Hypertension was associated with HGS ($r=0.59, p \leq 0.001$), 5STST ($r=0.44, p \leq 0.001$) and BMI ($r=0.4, p \leq 0.05$).
Conclusions: This study revealed a high prevalence of sarcopenia among older adults with hypertension (22.4%). Current research confirms that sarcopenia is associated with hypertension. These results may have significant impact in both prevention and treatment techniques for older adults with sarcopenia and hypertension. Future studies should investigate more factors that could influence older adults with hypertension and sarcopenia.
Funding: This paper has been financed by the funding programme "MEDICUS", of the University of Patras", Greece.
Keywords: hypertension, sarcopenia, hand grip strength

P1017

RELATIONSHIP BETWEEN FALL HISTORY AND THE ENHANCED PAPER GRIP TEST AMONG OLDER ADULTS: A PILOT STUDY

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Objective: To investigate the relationship between fall history and the enhanced paper grip test (EPGT).
Material and Methods: A convenient sample of 30 community dwelling adults of both genders agreed to participate in this study. Lower-limb strength was assessed using the EPGT. EPGT force was measured using a dynamometer (Omega engineering, UK). Hand Grip Strength (HGS) was assessed using a hand held dynamometer (Saehan Seoul, Korea). Anthropometric assessments were performed to measure the patients' weight, height and body mass index (BMI). Data on demographic characteristics, health conditions, history of falls, and psychological factors were collected using a pre-tested, structured questionnaire. The association between variables was calculated using Pearson-r correlation coefficients. Ethical approval was secured from University of Patras ethics committee.
Results: The mean age of the study population was 73.6 ± 4.8 years. Mean score on EPGT was 15.2±5.4 N. Out of the total of 30 participants, 12 people (40%) reported having a history of falling. Out of the 12 fallers, 8 were female (66.7%).Older adults with a history of falls appeared to have significantly lower HGS and lower EPGT force. Results record strong correlation for EGPT and HGS ($r=0.6, p \leq 0.001$) and moderate to strong correlation with history of falls ($r=0.41, p \leq 0.001$) and
Conclusions: The present study found statistically significant positive moderate-strong correlations between EPGT force, HGS and history of falls. The proposed EPGT could be used to monitor muscle strength and it may be used for falls-risk assessment. Further research is required to assess the clinical value of this measurement for the prevention of falls in the older population.
Keywords: enhanced paper grip test, muscle strength, falls
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P1018

LEVEL OF PHYSICAL ACTIVITY AND ITS ASSOCIATED FACTORS AMONG GREEK POSTMENOPAUSAL WOMEN

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Objective: To investigate the relationship between physical activity, quality of life, anxiety and depression in postmenopausal Greek women.
Material and Methods: This cross-sectional clinical study included 219 postmenopausal women. A structured interview schedule was used to collect information on the participants' age, general health status, education level, time since last menstruation, hormonal therapy use, socioeconomic status, and smoking habits. Menopausal status was determined based on a self-report. Osteoporosis diagnosis was confirmed by participants' recent dual-energy X-ray absorptiometry (DXA) measurement. The female participants were asked to fill out the International Physical Activity Questionnaire-short form (IPAQ), the Hospital Anxiety and Depression Scale (HADS), and the EuroQol (EQ-5D-5L) instru-

ment. The Ethics Committee of the University of Patras, Greece, approved the study protocol.
Results: A total of 219 postmenopausal women with an age of 61.4 ± 6.1 years were studied. Out of the total postmenopausal women studied, 64.8% were physically active. The physical activity level of the female participants ranged from 500 to 3358 MET-min/week (mean value of MET-min/week: M = 1383.46 ± 1030.12). A total of 39.7% (n = 87) of the female Greek participants were diagnosed with osteoporosis. Physical activity among postmenopausal Greek women showed a strong correlation with quality of life ($r = 0.5$; $p \leq 0.001$) and age ($r = 0.55$; $p \leq 0.001$) and a medium correlation with the HADS ($r = 0.4$; $p \leq 0.05$).
Conclusions: The majority of the Greek postmenopausal women were physically active. The findings provides important health-related data of a group not previously studied in Greece. In addition results underscore the significance of fostering physical activity and quality of life among postmenopausal women to formulate efficacious therapeutic interventions.
Keywords: physical activity, menopause, anxiety, depression

P1019

EVALUATING THE PREDICTIVE POWER OF THE FRACTURE RISK ASSESSMENT TOOL (FRAX): A DECADE-LONG ASSESSMENT OF FRACTURE RISK IN OSTEOPOROTIC PATIENTS

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Objective: To evaluate the predictive performance of The Fracture Risk Assessment Tool (FRAX) by analyzing its 10-year fracture risk predictions against the actual fracture outcomes observed over a decade-long follow-up period.
Material and Methods: This retrospective cohort study is being conducted at the Department of Pathology and Laboratory Medicine in collaboration with the Department of Radiology, Aga Khan University Hospital, Karachi, Pakistan. The institutional review committee granted an ethical exemption due to its retrospective design. The study includes 750 patients diagnosed with osteoporosis based on Dual-energy X-ray Absorptiometry (DEXA) imaging in 2014, with the FRAX, applied to calculate their 10-year probability of major osteoporotic and hip fractures. Data on demographic characteristics, clinical parameters, DEXA scan results, and FRAX predictions were extracted from medical records. Patients are being followed up for 10 years (2014–2024) to assess fracture occurrences, primarily through telephonic calls. Descriptive analyses summarized the demographic and clinical characteristics of the study population, and the predictive performance of the FRAX was evaluated by calculating sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) using SPSS version 23.
Results: Among 160 patients evaluated, 16 (10.0%) sustained fractures, with the femoral neck being the most common site (n=6, 37.5%). The cohort was predominantly female (152, 96.2%) with a mean age of 59.7 ± 1.35 years, mean weight of 69.8 ± 13.0 kg, and mean height of 153.6 ± 6.91 cm. Prior fracture history was reported by 7 (4.4%) patients, while 8 (5.3%) had a parent with a history of hip fracture. Most patients reported no smoking history (155, 96.9%), no glucocorticoid use (157, 98.1%), no rheumatoid arthritis (157, 98.1%), and no evidence of secondary osteoporosis (145, 90.6%). All patients (100%) reported consuming less than three units of alcohol daily. The FRAX demonstrated a sensitivity of 68.75%, a specificity of 90.91%, a PPV of 45.83%, and an NPV of 96.30%.
Conclusion: Our study's preliminary findings highlight the potential utility of FRAX in identifying patients at low risk of fractures.

P1020

IMPACT OF MULTIPLE MYELOMA ON BONE METABOLISM: INSIGHTS FROM BONE STATUS INDICES

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Objective: To compare bone status indices between patients with multiple myeloma and healthy controls to assess the impact of multiple myeloma on bone health.
Material and Methods: This analytical cross-sectional study was conducted at the Department of Pathology and Laboratory Medicine, Aga Khan University Hospital, Karachi, Pakistan, following ethical approval from the institutional review board. Patients diagnosed with multiple myeloma during the year 2024 were identified through serum protein electrophoresis and immunofixation electrophoresis. Eligible patients were approached to evaluate their bone status indices (BSIs), including serum levels of Osteocalcin, Procollagen 1 Intact N-Terminal Propeptide (P1NP), and C-terminal telopeptide of type I collagen (β-CTX). BSIs were measured using the Cobas e801 analyzer (Roche Diagnostics) via the electrochemiluminescence immunoassay technique, adhering to the manufacturer's protocols. Data analysis was performed using SPSS version 23. Descriptive statistics were used to summarize patient demographics and BSIs, and comparative analyses were conducted to explore differences in BSIs. A p-value of <0.05 was considered statistically significant.
Results: A total of 46 patients diagnosed with multiple myeloma were included in the study, comprising 29 males (63%) and 17 females (37%). The median age of the patients was 57.5 (46.8–67.8) years. The median levels of BSIs in multiple myeloma patients were as follows: Osteocalcin, 6.64 (3.02–15.5) ng/mL; P1NP, 60.25 (29.7–93.2) ng/mL; and β-CTX, 0.04 (0.02–0.09) ng/mL. For comparison, BSIs were also analyzed in 40 healthy controls.

The median BSI levels in the control group were Osteocalcin, 7.48 (5.8–10.5) ng/mL; P1NP, 45.95 (34.2–54.8) ng/mL; and β-CTX, 0.03 (0.01–0.05) ng/mL. The Mann-Whitney U test was applied to compare the median BSI levels between patients with multiple myeloma and healthy controls. The analysis revealed a statistically significant difference in β-CTX levels ($p = 0.03$) between the two groups, with higher levels observed in multiple myeloma patients. However, no significant differences were observed for Osteocalcin ($p = 0.80$) or P1NP ($p = 0.12$) levels.
Conclusion: Based on the findings, β-CTX levels were significantly elevated in patients with multiple myeloma compared to healthy controls, suggesting altered bone resorption in this population.

P1021

DOES GENICULAR NERVE BLOCK IMPROVES QUALITY OF LIFE IN END STAGE OSTEOARTHRITIS?

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Objetivo: Ao tentar oferecer algum conforto aos pacientes com osteoartrite grave do joelho (OAJ) que podem ou não querem ser submetidos à artroplastia total do joelho, comparamos os resultados algofuncionais do bloqueio do nervo genicular com anestésico ou fenol em pacientes com osteoartrite grave do joelho.
Material e Métodos: Trinta e quatro pacientes com Kelgren&Lawrence grau IV grave e Alhback graus 3 a 4, aguardando artroplastia total do joelho, foram submetidos ao bloqueio do nervo genicular de todos os joelhos com OAJ grave. Eles foram randomizados em dois grupos, ou seja, bloqueio por ropivaína e bloqueio por fenol 5% 2ml em cada nervo genicular (inferior-medial, superior-medial e superior-lateral). Os pacientes foram avaliados na inclusão e 1 mês e 3 meses por VAS, WOMAC (1-96), Timed-Up-and-Go (TUG) e teste de sentar e levantar de 30 segundos (30STS).
Resultados: Os grupos foram semelhantes na inclusão para todas as variáveis com IMC de 36,5 ± 8,9 (ropivacaína) e 34,8 ± 8,8. TUG e 30STS não melhoraram devido ao bloqueio do nervo genicular indistintamente pelo método ou em qualquer período de tempo. Ambos os grupos apresentaram melhorias não significativas no WOMAC total e em todos os subconjuntos (Tabela). Os resultados VAS melhoraram 1,38 (grupo Fenol) da linha de base até 1 mês ($p = 0,001$), mas pioraram 1,15 pontos entre 1 e 3 meses (não duradouro) ($p = 0,45$). No grupo anestésico, nenhuma melhoria significativa ocorreu em nenhum momento.
Conclusão: O bloqueio do nervo genicular na OA grave do joelho pode oferecer uma leve melhora na dor por um curto período de tempo com fenol, enquanto quando bloqueado com ropivacaína a melhora não é relevante por um mês.

P1022

THE ASSOCIATION OF FRAILTY INDEX-LABORATORY (FI-LAB) SCORES WITH OSTEOPOROTIC FRACTURE RISK IN OLDER ADULTS: A RETROSPECTIVE COHORT STUDY

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Introduction and Objective Osteoporotic fractures represent a significant cause of morbidity and mortality in older adults and are frequently associated with increased frailty. The Frailty Index-Laboratory (FI-lab) is a quantitative tool that assesses frailty by analyzing deviations in routine laboratory parameters. This study aimed to evaluate the association between FI-lab scores and the prevalence of osteoporotic fractures in individuals aged 65 years and older.
Materials and Methods In this retrospective cohort study, 15,814 patients aged ≥65 years were analyzed from the MIMIC 3 database. Of these patients, 3,200 (20.2%) had documented osteoporotic fractures. FI-lab scores were calculated based on 24 routine laboratory parameters, including hematology, biochemistry, inflammatory markers, and liver function tests. Mean FI-lab scores were compared between patients with and without osteoporotic fractures.
FI-lab Calculation Methodology A systematic approach was employed to assess frailty based on laboratory abnormalities. Each parameter was assigned a value of 1 if outside the normal clinical range and 0 if within range. The FI-lab score was calculated by dividing the number of abnormal parameters by the total number of parameters evaluated. The examined parameters were categorized into four main groups: hematology (hemoglobin, white blood cell count, platelet count), biochemistry (albumin, creatinine, glucose, urea, sodium, potassium), inflammatory markers (CRP, ESR), and other tests (liver enzymes, bilirubin, coagulation profiles).
Demographic Data Of the total 15,814 patients included in the study, 64.3% were female. The mean age was 73.5 ± 6.8 years. The study group comprised 3,200 patients (20.2%) with osteoporotic fractures, while 12,614 patients (79.8%) without fractures formed the control group.
Primary Findings Patients with osteoporotic fractures demonstrated a mean FI-lab score of 0.487 ± 0.156, compared to 0.463 ± 0.149 in the control group ($p<0.05$). The odds ratio (OR) was calculated as 1.42 (95% CI: 1.28-1.58)(figure-1). Among laboratory parameters, the most pronounced abnormalities were observed in elevated CRP (52% in fracture group vs. 38% in control group), decreased albumin (48% vs. 32%), and reduced hemoglobin levels (45% vs. 35%)(figure-2).
FI-lab Score Distribution Analysis of FI-lab score distribution revealed that 35% of patients in the fracture group had scores within the 0.4-0.6 range, 28% within 0.2-0.4, and 17% within 0.6-0.8. In the control group, the majority of patients (35%) had scores within the 0.2-0.4 range. Both groups showed 5% of patients with scores

in the 0.8-1.0 range(figure 3).

Conclusions and Recommendations FI-lab has been identified as a valuable predictive tool for assessing frailty and its association with osteoporotic fracture risk in older adults. FI-lab scores above 0.4 show a significant correlation with increased fracture risk. Integration of this scoring system into clinical practice may facilitate the identification of high-risk populations and guide preventive strategies. Future prospective studies may further elucidate the predictive value of FI-lab.

Keywords Frailty index, laboratory parameters, osteoporotic fracture, older adults, risk assessment, FI-lab score, retrospective study

Figure1

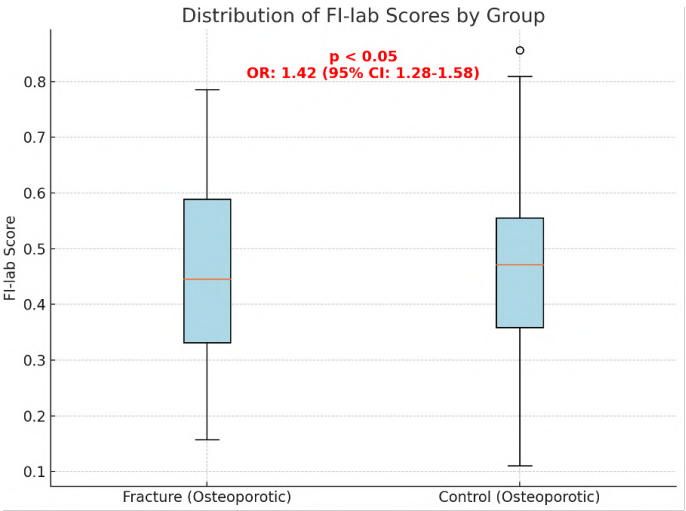


Figure 2

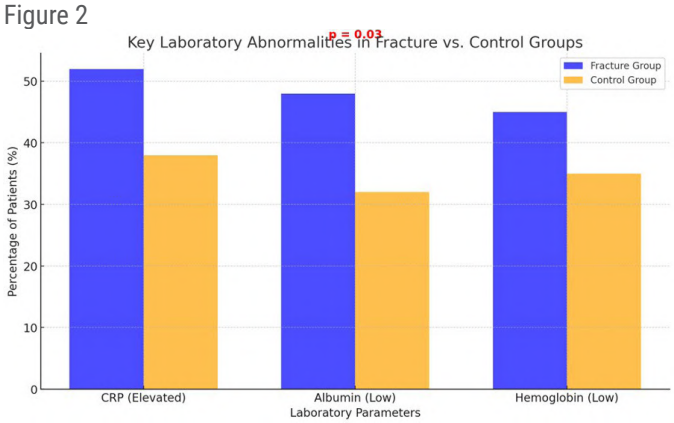
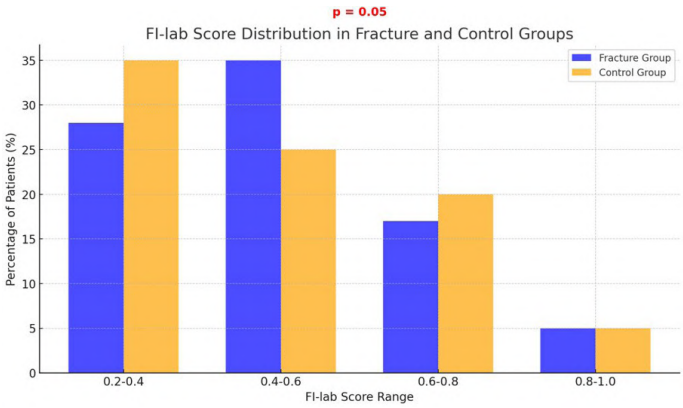


Figure 3



P1023

SERUM ANGIOPOIETIN-LIKE PROTEINS CONTENT IN PATIENTS WITH OSTEOARTHRITIS

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Angiopoietin-like proteins (Angptl) are involved in repair and remodeling of damaged tissues, but hyperfunction of some types of Angptl can induce and/or maintain chronic inflammation leading to progression of arthropathies of various genesis.

Purpose of the study:

To determine the correlations of serum levels of Angptl types 3, 4 and 6 with clinical and laboratory characteristics of osteoarthritis and comorbid conditions.

Materials and Methods.

34 patients with osteoarthritis (OA), of whom 5 (14.7%) were males and 29 (85.3%) were females, were included in the study. The average age of the patients was 60.0±7.9 years, the average duration of the disease was 11.8±9.6 years.

Generalized form of OA was observed in 25 people, obesity of various degrees - in 15 people, presence of metabolic syndrome (MS) was found in 10 people. Synovitis was registered in 26.5% of OA patients.

Results and Discussion.

When assessing the activity of the inflammatory process in patients with OA, we focused, first of all, on the presence of synovitis and laboratory indicators of the inflammatory process (ESR and CRP). Analysis of variance showed a significant effect of synovitis and high ESR/CRP on Angptl3 (p=0.04 and p=0.002, respectively), Angptl4 (p=0.02 and p=0.01, respectively) and Angptl6 (p=0.045 and p=0.03, respectively). The influence of these factors on the content of Angptl3 and Angptl6 was statistically insignificant (p>0.05), in contrast to Angptl4 (p=0.007), the levels of which were the highest in patients with synovitis on the background of pronounced inflammation.

MS was diagnosed in 29.4% of OA patients. Angptl3 content in patients with MS was higher than in OA patients without MS (M-W U

test, p=0.034), Angptl6 levels tended to increase in the presence of MS (M-W U test, p=0.06), and Angptl4 indices did not differ significantly in these groups (p>0.05). Obesity was detected in 44% of OA patients. Angptl4 content in obese patients was higher than in OA patients with normal body weight (M-W U test, p=0.025), while Angptl3 and Angptl6 were not significantly different in these groups (p>0.05).

Conclusions.

Obesity and synovitis have a significant effect on Angptl content in patients with OA. The highest Angptl4 values are observed in patients with synovitis on the background of pronounced inflammation (high ESR and CRP).

P1024

PHYSICAL ACTIVITY LIMITATIONS ARE ASSOCIATED WITH FATIGUE AND DEPRESSION IN PATIENTS WITH RHEUMATIC DISEASES

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Purpose of the study:

To evaluate the effect of physical activity on depression and fatigue in patients with rheumatoid arthritis (RA) and systemic lupus erythematosus (SLE).

Methods:

52 patients with RA and 54 patients with SLE completed a program of additional physical activity (daily dosed walking of 30-60 minutes) during a 4-week rehabilitation cycle.

The total index of kinesiophobia was calculated using The Tampa Scale for Kinesiophobia (TSK) questionnaire, the level of fatigue was evaluated using the VAS screening scale and the FACIT scale. The Beck Depression Inventory (BDI-II) was used to assess the presence of depressive symptoms.

Results and Discussion:

According to the level of physical activity, patients were divided into groups with sedentary lifestyle (less than 5.5 thousand steps per day) and groups with mobile lifestyle (more than 6 thousand steps per day). In the groups with a mobile lifestyle, there was a decrease in fatigue scales (for RA: VAS and FACIT p<0.01; for SLE: VAS p=0.026, FACIT p=0.009), a decrease in psychological (for RA p<0.01; for SLE p<0.001) and physical components of TKS (for SLE p<0.001). At the end of the rehabilitation program, the number of patients with different levels of depression in SLE did not change (p>0.05), while in RA it decreased from 65.4% to 52%. Moreover, a negative correlation of medium strength was established between depression and vitamin D levels (r = -0.38) in patients with RA. It is possible that vitamin D may indirectly participate both in inflammatory processes and in central sensitization, which provokes chronic pain and psychological disorders. Patients with sedentary lifestyle did not show positive changes in depressive symptoms (p>0.05) and fatigue scores (for RA: VAS and FACIT p>0.05; for SLE: VAS p>0.05). In patients with SLE, low physical activity led to increased fatigue on FACIT (p=0.043) and increased level of kinesiophobia (p=0.025), while in RA patients a slight decrease in total TKS score (p=0.036) was mainly due to the psychological component.

Conclusions:

In patients with rheumatic diseases, kinesiophobia and severe fatigue are important barriers to physical activity. Motivating patients to overcome their irrational fear of active movement may help to increase endurance and reduce the risk of depression.

P1025

ASSOCIATIONS BETWEEN BODY COMPOSITION, EXERCISE, DIET, SHORT-CHAIN FATTY ACIDS, AND BONE LOSS IN EARLY POSTMENOPAUSAL WOMEN

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Objective

The early postmenopausal period is characterized by a rapid loss in bone mineral density (BMD), which emphasizes the importance of lifestyle factors as important predictors and targets for preventive interventions. This study aimed to assess the relationship between bone characteristics and factors like nutrient intake, body composition, physical activity, and plasma SCFAs; and to identify which of these factors predict changes in bone characteristics over 2 years in early postmenopausal women.

Material and Methods

This cross-sectional and longitudinal study involved 223 early postmenopausal Swedish women aged 50 to 60 years who participated and completed the 2-year ELBOW II clinical trial. Appendicular lean mass (ALM), fat mass (FM), and BMD were measured using dual x-ray absorptiometry (DXA), and tibia total volumetric BMD (vBMD) and microstructure by high-resolution peripheral computed tomography (HR-pQCT). Additionally, dietary intake, physical activity levels, and plasma short-chain fatty acids (SCFAs) were evaluated.

Results

In multiple linear regression analyses, weight and body mass index (BMI) were significant predictors for all bone parameters. ALM and FM were associated with BMD, with the strength of these associations varying by bone site. Over the 2-year period, the relative change (Δ) in ALM had a stronger association with bone changes than ΔFM. Women in the lowest tertile of ΔALM (ΔALM: -3.5 kg) and baseline FM (FM: 16.5 kg) experienced approximately 2.7-fold and 4.4-fold significantly greater reductions in total hip BMD and tibia total vBMD, respectively, compared to those in the highest tertiles. No consistent associations were ob-

served for changes in neither macronutrient intake nor physical activity and the degree of bone loss. A positive relationship was found between Δisobutyric acid levels and bone loss, suggesting that gut microbiota metabolites may influence bone health.
Conclusion
Women with greater FM and maintaining/increasing ALM are linked to less development of skeletal fragility, typically seen in early postmenopausal women.

Acknowledgments: Chalmers Mass Spectrometry Infrastructure and the SciLifeLab Metabolomics platform provided support with metabolite

P1026

SERUM INFLAMMATORY MARKERS IN OSTEOPOROTIC FRACTURE PATIENTS: A SURVEY IN THE FRACTURE LIAISON SERVICE AT SHAFA YAHYAEIAN ORTHOPEDIC HOSPITAL, TEHRAN, IRAN

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Background: Fracture Liaison Service (FLS) is a healthcare model aimed at preventing re-fractures by diagnosing, investigating, and treating osteoporosis, as soon as possible, in patients with the history of previous osteoporotic fragility fracture. As per the literature, secondary causes of osteoporosis can affect two-thirds of older men, and 30% of postmenopausal women. Monoclonal gammopathy of uncertain significance, Multiple myeloma and chronic infectious diseases are important causes of secondary osteoporosis And patients can present with fragility fracture as a first presentation of underlying disease. Measurement of inflammatory markers, such as ESR (erythrocyte sedimentation rate) and CRP (C-reactive protein), has important role in assessing secondary osteoporosis. The measurement of inflammatory markers, while being easy to measure and affordable, can be helpful in guiding the team to screen for secondary osteoporosis.
Objective: To analyze ESR and CRP levels in patients with osteoporotic fractures and to assess their associations with patients' demographics and clinical characteristics.
Materials and Methods: In this retrospective cross-sectional study, 1979 patients who were enrolled in the FLS clinic of Shafa Yahyaeian Orthopedic Hospital between October 2020 and May 2023 were included. The main outcome was determining the percentage of patients with high ESR and CRP levels and investigating the relationship between these markers and the demographic/clinical variables. The data were analyzed using SPSS version 26 software.
Results: Out of 1979 patients, 32% had elevated ESR levels, and 40% had elevated CRP levels. Females, older patients, those with higher BMI (body mass index), and patients with lower BMD (bone mass density) in the femoral neck, hip, and radius had significantly higher ESR levels. Higher CRP levels were significantly associated with male sex, lower BMI, lower BMD in the radius, and lower serum vitamin D. Necessary investigations were done to rule out the causes of secondary osteoporosis, including malignancy and infection, in patients who had elevated ESR and CRP, and no cases of secondary osteoporosis were found.
Conclusion: Although about one third of our patients had high ESR or CRP, No case of secondary osteoporosis were identified, suggesting not to check inflammatory factors in the acute phase of fracture. The high level of inflammatory factors in the early phase of fracture may be attributed to physiological process of fracture healing.
Keywords: Fracture Liaison Service, inflammatory markers, secondary osteoporosis

P1027

HIGH INCIDENCE OF OSTEOPOROTIC FRACTURES IN ADULTS UNDER 65 WITHOUT INDICATIONS FOR BMD TESTING: A CALL TO REEVALUATE SCREENING GUIDELINES

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Background: Despite the availability of effective interventions, a substantial number of osteoporosis patients remain underdiagnosed and undertreated, particularly those under 65 years of age. This study aimed to assess the incidence of osteoporotic fractures in patients under 65 years referred to a Fracture Liaison Service (FLS) clinic and to evaluate the applicability of current Bone Mineral Density (BMD) testing guidelines.
Methods: We conducted a retrospective review of the medical profiles of patients enrolled in the FLS clinic from April 2022 to March 2024. The primary outcome of the study was the incidence of osteoporotic fractures in individuals under 65 years of age and no BMD indication presented with a fragility fracture to the FLS clinic of our subspecialty orthopedic hospital. The secondary outcome of the study was the frequency of different BMD indications in this population.
Results: Among the 1,248 patients analyzed, 772 (61.9%) were under 65 years. Of these, only 27% had indications for BMD testing according to the International Society for Clinical Densitometry (ISCD) guidelines. Diseases or conditions associated with bone loss were the common BMD indication in this group (n=139, 18%). Diabetes was the most frequent underlying condition, justi-

fying the BMD testing (n=116, 15%).
Conclusions: A significant proportion of patients under 65 years with fragility fractures do not meet current BMD testing criteria, potentially leading to unrecognized osteoporosis and subsequent fractures. This underscores the urgent need to revise osteoporosis screening guidelines to better identify at-risk individuals, thereby reducing the burden of fragility fractures.
Keywords: Osteoporosis, fragility fracture, Fracture Liaison Service, bone mineral density

P1028

ADVANCEMENTS IN UNDERSTANDING AND MANAGING HYPOPHOSPHATASIA: FROM CLINICAL SPECTRUM AND DIAGNOSIS TO THERAPEUTIC STRATEGIES

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Hypophosphatasia (HPP) is a rare, inherited metabolic disorder characterized by mutations affecting the gene responsible for producing the tissue-nonspecific isoenzyme of alkaline phosphatase (TNSALP). This condition spans a wide clinical spectrum, ranging from severe, life-threatening infantile forms to milder adult presentations that primarily affect dental health and bone integrity. Diagnosing HPP involves a combination of clinical observation, radiographic findings, laboratory testing, and genetic screening. Despite its clear clinical markers, the disease often remains unrecognized for extended periods, underscoring the importance of increased vigilance among dentists, orthopedic surgeons, and rheumatologists. The therapeutic landscape, particularly for severe cases in infants, children, and adults, has been significantly enhanced by treatments, such as Asfotase alfa, though questions remain about treatment duration. The past decade has brought forth significant advancements in understanding HPP's pathophysiology, including the pivotal role of persistently low serum alkaline phosphatase (AP) levels, offering new avenues for its management. HPP constitutes a rare genetic disorder with diverse clinical presentations. Characterized by six distinct forms categorized by age of onset and severity—perinatal, infantile, childhood (severe and mild), adult, and odonto—HPP manifests variably, presenting diagnostic challenges. The diagnosis, reliant on clinical, radiographic, and laboratory assessments, entails crucial laboratory criteria, including low serum ALP, elevated urinary PEA, and serum PLP levels. Confirming the diagnosis requires the identification of mutations in the TNAP gene. Genetic testing assumes a pivotal role in confirming HPP diagnoses, elucidating the underlying genetic mutations responsible for TNSALP dysfunction.
This serves a dual purpose: Substantiating the diagnosis and unraveling the intricate interplay between genetic variants and clinical presentations. The primary therapeutic avenue for severe HPP manifestations is Asfotase alfa (Strensiq), serving as a first-line treatment in infants, children, and select adults. Notably, antiresorptive treatments are strictly contraindicated in HPP, as they may exacerbate the underlying pathophysiology and elevate the risk of AFF. This holistic perspective underscores the multidimensional challenges and intricacies of HPP diagnosis and management, necessitating a comprehensive unde standing of its diverse clinical manifestations and therapeutic considerations.

P1030

HIDROXIVITAMIN D DEFICIENCY, OSTEOPENIA, AND LEAN MASS IN KNEE OSTEOARTHRITIS: WHAT IS THE INFLUENCE OF OBESITY IN INDIVIDUALS WITH PAINFUL SYMPTOMS? - A CROSS-SECTIONAL STUDY

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Objective: Obesity is one of the main risk factors for the development of knee osteoarthritis (KOA). Obese individuals may invariably have lower plasma concentrations of vitamin D. This factor may exacerbate painful symptoms resulting from joint overload and the progression of KOA, in addition to playing a fundamental role in metabolism and the properties of the musculoskeletal system. The present study aimed to analyze the association between the presence of obesity and vitamin D levels, painful symptoms, and body components in individuals with KOA.
Methods: Participants aged 40 or older with a clinical diagnosis of KOA were included. Blood samples were collected in the morning after a 12-hour fast for hydroxyvitamin D assessment by a specialized laboratory. Dual-energy absorptiometry (Hologic DXA) defined the presence of obesity and quantified lean and bone mass indices. Painful symptoms were assessed with an Algomed digital pressure algometer (Medoc, Israel) at a point on the medial joint line of the knee with the greatest pain. Analyses were conducted using R Studio with $p < 0.05$ considered significant.
Results: Fifty individuals were recruited: 44% obese and 70% female, with a mean age of 58.5 years. Hydroxyvitamin D levels averaged 27.8 ng/mL, considered insufficient. Bone mass was -0.9, approaching the limits of osteopenia, with lean mass values indicating 6.4 for females and 8.5 for men within the recommended values. Painful symptoms averaged 231,8 kPa reflecting decreased hyperalgesia. A multiple linear regression model revealed that sex ($p<0.01$), hydroxyvitamin D ($p<0.05$), bone mass ($p<0.05$), and lean mass ($p<0.01$) predicted 68% of the presence of obesity in patients with KOA.
Table 1. A linear regression model that explains the obesity association with sex, hydroxyvitamin D, body components and painful symptons

Predictors	ß	SE	t-value	P-value	R^2	R^2 adj
Intercept	6.539	3.426	1.91	0.063	0.709	0.675
Sex	-7.877	1.290	-6.10	<0.001*		
Hydroxyvitamin D	-0.128	0.053	-2.39	0.021*		
Bone mass	-1.270	0.415	-3.06	0.003*		
Lean mass	4.095	0.431	9.49	<0.001*		
Painful symptons	-0.002	0.003	-0.70	0.485		

Dependent variable: Obesity
Independent variables: Sex, hydroxyvitamin D, body components, painful symptons
Abbreviations: SE = Non-standard beta standard error.
Conclusion: Body components, hydroxyvitamin D deficiency, and sex correlate with obesity in patients with KOA, with no significant association with pain symptoms. These findings highlight the need to explore metabolic alterations caused by excess adiposity in the treatment of KOA.

P1031

KNEE OSTEOARTHRITIS AND USE OF MULTIPLE MEDICATIONS: WHAT IS THE INFLUENCE OF THE PRESENCE OF DRUG-DRUG INTERACTION ON THE PRESSURE PAIN THRESHOLD OF THESE INDIVIDUALS?

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Objective: Pain in knee osteoarthritis (KOA) is associated with symptom severity, and pain drugs are the main treatment. Patients with KOA, especially women, report having multiple comorbidities, which increase their use of other drugs. The presence of drug-drug interactions (DDIs) in this population deserves further investigation. This study examines the association between DDIs and local pressure pain threshold (PPT) in patients with KOA.
Methods: Sixty-four patients (32 women and 32 men) with KOA and aged over 40 years were evaluated. PPT was assessed at the most symptomatic knee (local site). The Drugs.com® database was used to assess the presence or absence of DDIs among drugs used for KOA pain and other comorbidities. The Statistical Package for Social Sciences software was used for all statistical analyzes and the significance level was set at 5%.
Results: Participants' mean age was 58.9 ± 9.3 years. Self-reported comorbidities included systemic arterial hypertension (45.6%) and type 2 diabetes mellitus (24.1%). Drugs.com® identified 15 major (8.2%), 85 moderate (81.7%), and 4 minor (3.8%) DDIs. Women with DDIs had a PPT of 2.3 ± 0.9 kgf/cm² vs. 2.8 ± 0.7 kgf/cm² without DDIs. Men with DDIs had 3.8 ± 1.4 kgf/cm² vs. 4.8 ± 1.5 kgf/cm² without DDIs. Multiple linear regression showed DDIs ($p = 0.008$) and sex ($p < 0.001$) predict 36% of local PPT variability (Tab. 1).
Table 1. A linear regression model that explains the association of Local PPT results with sex, DDIs, and comorbidities

	ß	S.E	*t* value	*p-value*	R^2	R^2 adj
					0.390	0.360
Intercept	4.8089	0.3055	15.74	0.000		
Sex	-1.7567	0.3099	-5.67	<0.001*		
DDI	-0.6580	0.3799	-1.73	0.008*		
Comorbidities	0.2070	0.3932	-0.53	0.600		

Dependent variable: Local PPT
Independent variables: Sex, DDIs, and comorbidities

Conclusion: The presence of DDIs in women may predict worse outcomes of local PPT. These results highlight the relevance of treating comorbidities in women, to achieve better results in the management of pain symptoms in patients with KOA.

P1032

INITIATION OF ANTI-OSTEOPOROSIS MEDICATION, CALCIUM AND VITAMIN D SUPPLEMENTATION AMONG PATIENTS REFERRED TO THE FRACTURE LIAISON SERVICE (FLS)

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INTRODUCTION:
Osteoporosis, characterized by excessive bone loss, poses significant public health challenges for elderly individuals, both men and women. The most alarming complication is that it significantly increases the risk of fractures due to fragile bones. Pharmacological treatment, including antiosteoporosis medications as well as calcium and vitamin D supplementations, is vital in treating fragility fractures.
MATERIALS AND METHODS:
This prospective study conducted from 1st January to 1st July 2024, focusing on elderly patients aged 55 years and above who presented with fragility fractures at our hospital. Identification of these patients was conducted by our Fracture Liaison Service (FLS) Coordinators, excluding those with severe trauma, malignancy, or steroid-induced fractures. Comprehensive demographic data, medication prescriptions, and surgical information were meticulously recorded. Patients were initiated on osteoporosis-related treatment. Prescription and usage of anti-osteoporosis medication, calcium and vitamin D supplementation was observed among patients that were enrolled.
RESULTS AND DISCUSSION:
A total of 87 patients were identified and consulted by the FLS. More than half of the referred patients were Chinese (56.3%, n= 49), followed by Malay (33.3%, n=29) and Indians (10.3%, n=9). Remarkably, 100% of these patients received both calcium carbonate (CaCO3) and vitamin D supplementations. These vitamin

D supplements were inclusive of calcitriol (60.9%, n=53), alfacalcidol (28.7%, n=25), cholecalciferol (6.9%, n=6) and Vitamin D3 (3.4%, n=3) either upon discharge or during follow-up. Among the patients with fragility fractures, 72 (82.8%) patients agreed to initiate anti-osteoporosis medications. Subsequently, the majority opted for anti-resorptive treatment (65.5%) over anabolic therapy (17.2%).

Based on these results, we observed an increase in the percentage of patients opting for anabolic compared to our previous study. This may be due to the education given to the patient and family members to increase knowledge on the pharmacological actions between anabolic and antiresorptive for post-fracture care and minimize the risk for subsequent fractures.

Next, as an FLS center, we administered CaCO3 because it holds the highest percentage of elemental calcium in the body. For Vitamin D, our center offers a variety of choices, thus empowering patients in the treatment options, as some of the medications are not funded by the federal government. The dedication of FLS has resulted in a marked improvement of anti-osteoporosis medication, CaCO3 and Vitamin D supplementation compared to when our center was first established.

CONCLUSION:

The integration of FLS and the collaborative efforts among a multidisciplinary team have significantly improved the management of osteoporosis in our hospital.

P1033

DEMOGRAPHIC AND FRACTURE TYPES ANALYSIS OF FRAGILITY FRACTURE PATIENTS REFERRED TO FRACTURE LIAISON SERVICE (FLS) AT A LEADING MALAYSIAN UNIVERSITY HOSPITAL

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INTRODUCTION:

Fragility fractures also known as osteoporotic fractures are a significant concern in elderly populations, necessitating a systematic approach to patient assessment and fracture risk management. Gender and racial distribution play a pivotal role in understanding the demographics of patients presenting with such fractures. Furthermore, identifying the types of fractures is crucial for tailoring prevention and management strategies.

MATERIALS AND METHODS:

This study using prospective analysis includes data collected from 150 patients referred to the Fracture Liaison Service (FLS) between January 2024 and November 2024, with two reported deaths. This study focusing on elderly patients aged 55 years and above who presented with fragility fractures at our hospital. Identification of these patients was conducted by our Fracture FLS Coordinators, excluding those with severe trauma, malignancy, or steroid-induced fractures. Patient demographics were categorized by gender and race, while fracture types were analyzed to determine the most prevalent patterns.

RESULTS AND DISCUSSION:

Among 150 patients referred to FLS, 76% (n=114) were female, and 24% (n=36) were male, consistent with the higher prevalence of osteoporosis in women. Racial distribution revealed that 54% (n=81) of patients were Chinese, followed by Malays at 37% (n=56), Indians at 7% (n=11), and other ethnicities at 2% (n=2). Analysis of fracture types demonstrated that hip fractures were the most common, accounting for 69% (n=104) of cases, followed by lower limb fractures at 8% (n=13), and spine fractures at 5.5% (n=8) as well as wrist fractures with similar value. Combination fractures and other minor fracture types collectively represented the remaining 12%.

The predominance of hip fractures underscores the need for early intervention strategies, as these are often associated with significant morbidity and mortality in elderly populations. Tailored prevention programs addressing racial and gender disparities could improve overall outcomes.

CONCLUSION:

The findings highlight the importance of demographic and fracture type data in managing fragility fractures. A targeted approach combining early detection tools like dual-energy x-ray absorption (DEXA) scans and complementary assessments such as the Fracture Risk Assessment Tool (FRAX) score is critical for optimizing care in high-risk groups. The predominance of hip fractures necessitates urgent action to prevent future occurrences, particularly among women and specific racial groups.

P1034

EVALUATION OF THE DIAGNOSIS ACCURACY OF THE ASIAN WORKING GROUP FOR SARCOPENIA 2019 CRITERIA FOR 'POSSIBLE SARCOPENIA IN THAI COMMUNITY-DWELLING OLDER ADULTS

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Introduction

The term "possible sarcopenia" was introduced in the 2019 Asian Working Group for Sarcopenia (AWGS) guidelines to identify individuals at high risk for sarcopenia in primary care settings. However, limited studies have evaluated the accuracy of this definition. This study aims to validate the "possible sarcopenia" criteria in Thai community-dwelling older adults and explore methods to enhance its effectiveness.

Methods

This study is a secondary analysis of an epidemiological investigation on the prevalence of sarcopenia among Thai older adults conducted from 2021 to 2022. We assessed the performance of the "possible sarcopenia" criteria against sarcopenia diagnoses based on the 2019 AWGS guidelines. To improve performance, we incorporated demographic parameters such as age, sex, height, weight, and body mass index (BMI), comparing their area under the curve (AUC). The parameter with the highest AUC was

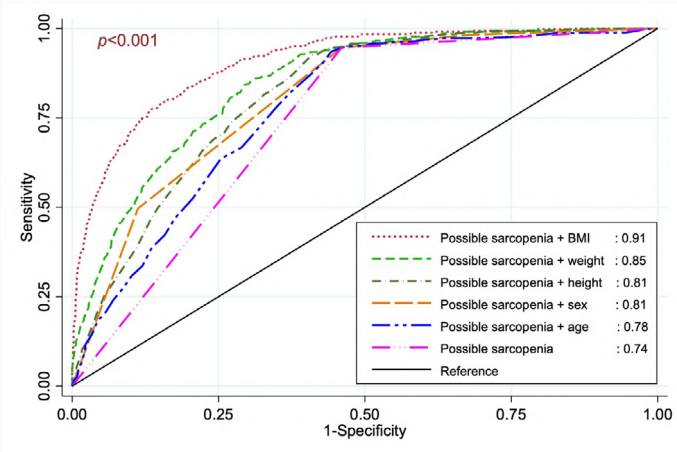
selected for modification of the criteria, and a cut-off value was established to maintain sensitivity above 80% while maximizing specificity.

Results

A total of 2,456 participants were included, with a mean age of 69.0 ± 6.1 years. Of these, 445 (18.1%) were diagnosed with sarcopenia. The "possible sarcopenia" criteria showed a sensitivity of 94.6%, a specificity of 54.0%, and an AUC of 74%. Incorporating BMI improved the AUC by 17%. A BMI below 24 kg/m² may serve as an additional criterion, enhancing specificity to 72.7% while maintaining sensitivity at 89.9%.

Conclusions

The AWGS 2019 "possible sarcopenia" criteria exhibited excellent sensitivity but lacked specificity, resulting in a high false-positive rate. The modified criteria incorporating BMI effectively reduce false positives while preserving high sensitivity, making them more suitable for sarcopenia screening in primary care.



P1035

VITAMIN D METABOLITE RATIO AS A MARKER OF NUTRITIONAL BONE HEALTH IN ADOLESCENTS

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Background: The vitamin D metabolite ratio (VMR) has recently gained attention as a promising marker of functional vitamin D status in adults and, to some extent, for evaluating bone health in the elderly. However, there is scarcity of evidence as to whether these findings may also apply to younger populations. This study aims to fill this gap.

Methods: The osteomalacia database of the Chair for Biomarkers of Chronic Diseases in King Saud University, Riyadh, Saudi Arabia (SA), is a registry containing clinical information of almost 3000 apparently healthy 12-17-year-old Saudi students from different schools in Riyadh, SA. A total of n=949 age- and body mass index (BMI) matched adolescents (n=513 girls, mean age=14.9 ± 1.8 years, mean BMI=23.0 ± 5.9; n=436 boys mean age=14.9 ± 1.7 years, mean BMI=23.7 ± 5.8) were included in this cross-sectional study. Anthropometric, biochemical [25(OH)D (VD), calcium (Ca), phosphorus, alkaline phosphatase, parathyroid hormone (PTH, n=64), fasting glucose and lipid profile] and dietary Ca data were retrieved from the database. Circulating VD metabolites [24, 25 VD; VD2; VD3; total VD] were assessed using liquid chromatography-tandem mass spectrometry (LC-MS/MS). VMR was calculated as [24,25(OH)D/25(OH)D] × 100. VD deficiency cut-offs were defined at 25(OH)D <50nmol/L, 24,25(OH)VD <3.0nmo/L, VD2 limit of quantification (LOQ) <1.8 and VMR <4% based on proposed cut-offs

Results: Over-all prevalence of VD deficiency was 86.5% and levels of VD metabolites were extremely low for all participants [Low 24, 25(OH)VD at 93.2%; VD2 LOQ<1.8 at 99.7%; Low VMR at 74.9%]. A subset analysis of 64 samples with PTH values revealed significant inverse associations with serum Ca (r=-0.34; p<0.01) and 25(OH)D (r=-0.28; p<0.05). In all VD metabolites, only VMR was significantly associated with serum Ca (r=0.07; p<0.05). With the exception of VD2, all VD metabolites, including VMR, were significantly associated with dietary Ca intake in girls, not boys.

Conclusion: VD metabolites, including VDR, are extremely low in a large subset of Saudi adolescents. VMR's modest but significant associations with serum and dietary Ca in girls suggest that it may be a sexually-dimorphic nutritional marker of bone health in adolescents rather than a marker of functional VD deficiency.

P1036

TEN-YEAR ATHEROSCLEROTIC CARDIOVASCULAR DISEASE RISK SCORE IN POST-MENOPAUSAL WOMEN WITH LOW BONE MINERAL DENSITY

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Background: Reports on the association between cardiovascular disease (CVD) risk and bone mineral density (BMD) remain inconsistent and hence more population-based studies on this subject are needed. **Aims:** This study aimed to evaluate the association between bone mineral density (BMD) at the lumbar spine (L1-L4) and femoral neck (right and left) with 10-year atherosclerotic cardiovascular disease (ASCVD) risk scores in Saudi postmenopausal women. **Methods:** A cohort of 1,450 postmenopausal women with risk of bone loss were analyzed using the data from the Chair for Biomarkers of Chronic Diseases (CBCD) Osteoporosis database. BMD at the lumbar spine and femoral neck was assessed via dual-energy X-ray absorptiometry (DXA). Anthropometric and biochemical parameters, including fasting glucose and lipid profiles, were measured. ASCVD risk scores were calculated using the ASCVD Risk Estimator Plus tool. BMD tertiles were examined for their association with ASCVD risk. **Results**: Women with osteoporosis exhibited significantly lower body mass index, waist

and hip circumferences, and metabolic dysfunction markers compared to those with normal BMD. Significant inverse correlations were observed between ASCVD risk scores and BMD at the femoral neck sites in women with osteopenia and osteoporosis. Multivariate logistic regression indicated that women in the lowest BMD tertiles had higher odds of intermediate-to-high ASCVD risk scores, with adjusted odds ratios of 1.90 for the lumbar spine, 2.19 for the right femoral neck, and 2.04 for the left femoral neck. **Conclusions:** The study identified significant associations between lower BMD at the lumbar spine and femoral neck sites and elevated 10-year ASCVD risk scores in postmenopausal women, particularly among those with osteopenia and osteoporosis. These findings demonstrate the importance of assessing cardiovascular risk in women with low BMD to enable early prevention and management strategies.

P1037

EFFECTS OF FIRST-LINE ORAL HYPOGLYCEMICS IN BONE MARKERS OF TREATMENT NAÏVE SAUDI ADULTS: BASELINE CHARACTERISTICS

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Background: It has been established that people with type 2 diabetes (T2D) are at higher risk of fracture as compared to the general population. Given the complex interplay of T2D on bone metabolism, findings on the effects of various T2D drugs on bone health and its markers remain inconsistent. This on-going randomized clinical trial (RCT) aims to present the baseline characteristics of participants after randomization and associations of baseline bone markers with measured parameters.
Methods: A total of 63 (55 males and 12 females) newly diagnosed T2D adults were randomized equally (1:1:1) to receive either metformin 1000mg alone (n=21), metformin 1000mg + lifestyle (n=21) and lifestyle alone (n=21) for 6 months. Anthropometrics, lipids, liver, glycemic and renal profiles were assessed routinely. Circulating sclerostin and osteocalcin were measured using commercially available assays. All measurements will be repeated every 3 months. Here we present the baseline data for the 3 treatment groups:
Results: Baseline characteristics showed no significant differences in anthropometrics, lipids, liver, glycemic and liver profiles, including sclerostin and osteocalcin across treatment groups (p-values >0.05). In all subjects, sclerostin was significantly associated with age (r=0.56; p<0.01), creatinine (r=0.46; p<0.01) and urea (r=0.60; p<0.01). On the other hand, osteocalcin was inversely associated with fasting glucose (r=-0.27; p<0.05) and HbA1c (r= -0.40; p<0.05).
Conclusion: The on-going RCT was able to successfully randomize a group of naïve T2D on different first line treatment regimens. The significant associations of sclerostin to markers of renal function and osteocalcin on glycemic profile highlight the extra-skeletal role of these bone markers in human metabolism. The present study will study the effects of first-line T2D treatment in these markers and concomitant changes in the baseline parameters assessed.

P1038

DO MYOKINES INFLUENCE THE ASSOCIATIONS BETWEEN SARCOPENIA-RELATED PARAMETERS AND COGNITIVE FUNCTION IN COMMUNITY-DWELLING OLDER ADULTS?: EXPLORATORY RESULTS FROM THE ENHANCE STUDY

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Objectives: This study aimed to explore the association between sarcopenia-related parameters and both global and specific cognitive domains, and whether myokines influenced this association.
Methods: An exploratory, cross-sectional analysis of data from the Exercise and Nutrition for Healthy AgeiNg (ENHANce) study, a 5-armed triple blinded RCT in older adults (≥65 years) with sarcopenia (EWGSOP2-criteria) was performed. Cognitive functioning was assessed by Mini-Mental State Examination (MMSE), Repeatable Battery for the Assessment of Neuropsychological Status (RBANS), Trail Making Test A&B (TMT), Stroop and Maze Test. Muscle mass and function were evaluated by measuring Hand-Grip Strength, Chair Stand Test, appendicular Lean Mass (aLM), Gait Speed (GS) and Short Physical Performance Battery (SPPB). Serum myokines (IGF-1, irisin, myostatin, BDNF) were determined through Enzyme Linked Immunosorbent Assay. Multivariable regression analyses were performed to explore the associations between sarcopenia-related parameters and cognitive functioning, with adjustment for confounders age, sex, body mass index, nutritional status, physical activity and the myokines.
Results : Fifty-eight participants were included in this analysis (76.2±6.7years,♀:65.5%). After adjustment for age, sex, body mass index, physical activity and nutritional status, aLM was significantly associated with MMSE (β=0.207,p=0.040), RBANS Total (β=0.206,p=0.011) and RBANS Attention (β=0.200,p=0.007), SPPB was significantly associated with Maze time (β=-0.306,p=0.024) and GS was significantly associated with TMT A (β=-0.240, p=0.009). After further adjustment for BDNF, the association between aLM and MMSE became non-significant. Adjustment for irisin, myostatin and IGF-1 did not influence the significance of the associations.
Conclusion: This study showed that several sarcopenia-related parameters, such as muscle mass and physical performance, are associated with both global and specific cognitive domains. Furthermore, BDNF may, at least partially, explain the association between muscle mass and MMSE. Additional research with larger sample size is needed to replicate these novel findings.

P1039

EFFECTS OF A HOME-BASED EXERCISE PROGRAM, PROTEINS AND OMEGA-3 SUPPLEMENTATION ON MUSCLE STRENGTH, MUSCLE MASS, PHYSICAL PERFORMANCE AND COGNITIVE FUNCTION IN OLDER ADULTS WITH SARCOPENIA: EXPLORATORY RESULTS FROM A 5-ARMED RCT

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Objectives:
This 5-armed RCT explores the (combined) effects of an exercise program, protein-and omega-3 supplementation on muscle strength, muscle mass, physical performance and cognitive function in older adults with sarcopenia.
Material & Methods:
Preliminary analysis of the ENHANce RCT data was performed. Participants were randomized into 5 groups: 1) Exercise, 2) Protein, 3) Exercise + Protein, 4) Exercise + Protein + Omega-3, 5) Control group. The primary outcome was the Short Physical Performance Battery (SPPB) score across the 5 groups, at baseline, 12 weeks (W12), and 24 weeks (W24). Secondary outcomes were appendicular lean mass, skeletal muscle index (SMI), handgrip strength, chair stand test, gait speed, and cognitive performance (Repeatable Battery for the Assessment of Neuropsychological Status (RBANS), Trail Making Test A&B, Stroop test, Maze test). Data analysis was performed using linear mixed models according to the intention-to-treat approach.
Results:
Among 58 participants (Ex, n=9; Prot, n=12; Ex+Prot, n=13; Ex+Prot+Omega-3; n=12; Control, n=12), the mean age was 76.19y (±6.59) & 65.52% were female. Ex+Prot group showed a significant SPPB score increase at W12 (1.13 point, 95%CI: 0.07;2.19), but was not significantly different from the Ex group (0.61 point, 95%CI: -0.63;1.86). Time-averaged group difference in SPPB (W12&W24) was not significant (Δ: 0.33, 95%CI -1.09;1.74). Ex+Prot+Omega-3 significantly improved SMI (2% increase, 95%CI: 1.00;1.04) vs. Ex+Prot (1% decrease, 95%CI: 0.98;1.01) after W12. Ex or Prot did not significantly improve sarcopenia outcomes vs. control at any time point. The Ex group showed significant improvements in RBANS Total and Immediate memory vs control group, and the time-averaged group difference was significant (Total; Δ:7.06 point, 95%CI: 1.89;12.23 & Immediate memory; Δ:10.33, 0.73;19.94). Mixed results on cognitive outcomes were found for the other groups.
Conclusion:
The combination of exercise and protein supplementation showed significant improvements in SPPB, but this was not significantly different from exercise only. Omega-3 on top of exercise and protein supplementation may have an additive effect on muscle mass. Results of the interventions on cognitive outcomes were mixed. Further research in a larger sample size is needed to confirm our findings.

P1040

THE FIRST-EVER MALTESE STUDY ON THE EPIDEMIOLOGY AND OUTCOMES OF FRAGILITY FRACTURES

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Objective
The aim of this study was to identify trends in prevention and management of osteoporotic fractures, including adherence to established screening recommendations, as this had never been studied locally.
Material and Methods
Data was handled through GDPR regulations. All fractures of the hip, vertebrae, humerus, radius, ulna and pelvis, occuring in individuals over the age of 18, between March and May 2024, were identified using imaging archiving software. These were then filtered for fragility based on electronic case record (ECR) documentation. Epidemiologic data were collected for the cohort, as well as whether eligible patients had been screened by means of a dual energy X-Ray absorptiometry (DEXA) scan prior to their fracture or not. A 6-month follow-up period was assigned to the patient cohort, and at the end of this study period their ECRs were reviewed once more to retrieve the osteoporosis management outcomes.
Results
A total of 543 fragility fractures were eligible for analysis. The majority of patients were female (n=406). Male patients had a younger mean age at time of fracture compared to females (69.9 vs 75.1). 441 patients met international screening recommendations, yet only 36.3% of patients had a DEXA scan pre-fracture (n=160). These were predominantly females, with only 4 of the 86 eligible males having had a DEXA scan. 62 of the 160 screened patients had osteoporotic DEXA results, yet only 24.2% (n=15) were managed with calcium and vitamin D and/or antiresorptives and/or anabolic agents. After the fracture, 4% had a DEXA requested (n=23), 12.9% had calcium and vitamin D prescribed (n=70), and 4.6% had an antiresorptive or anabolic agent prescribed (n=25). A lacuna was also identified in patients on glucocorticoids, as only 48% (n=12) had been screened with a DEXA scan prior to their fracture.
Conclusion
This study demonstrates poor use of screening tools and suboptimal management of osteoporotic fractures. The results of this study raised concern and brought about a number of changes in clinical practice, namely the establishment of a dedicated fracture liaison service, as well as education of other specialties about the management of osteoporosis.

P1041

DO RHEUMATOLOGISTS MANAGE GLUCOCORTICOID-INDUCED OSTEOPOROSIS BETTER THAN NON-RHEUMATOLOGISTS?

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Objective
Glucocorticoid-induced osteoporosis (GIOP) is a diagnosis which unites specialties. The aim of this audit was to compare screening and management strategies between various specialties where long-term oral glucocorticoids are prescribed.
Material and Methods
Data was handled through GDPR regulations. Patients over the age of 18 on longterm oral corticosteroids were defined as having had at least 3 months of a steroid dose equivalent to 5 mg daily of prednisolone or more. Rheumatology, Respiratory Medicine, Neurology and Gastroenterology physicians were then asked to identify patients meeting this definition, over the span of 3 months. Data was derived from 24 teams (6 per specialty) so as to eliminate bias. Electronic case records were then analysed, looking for any screening tests, as well as osteoporosis management strategies. Patients on steroid inhalers were excluded.
Results
The majority of long-term steroid patients belonged to Rheumatology (n=25), followed by Respiratory Medicine (n=12), Neurology (n=9) and Gastroenterology (n=6). With regards to screening, 100% of rheumatology patients underwent a dual energy X-Ray absorptiometry (DEXA) test within 1 year of starting treatment. On the other hand, respiratory medicine (50%), neurology (22.2%) and gastroenterology (16.7%) showed subpar screening rates. In terms of calcium and vitamin D prophylaxis, 100% of rheumatology patients received this, as opposed to 16.7% of respiratory patients, 11.1% of neurology patients, and 0% of gastroenterology patients.
In the screened patients who were diagnosed with GIOP, shortcomings were also identified. 83.3% of osteoporotic rheumatology patients received antiresorptives or anabolic agents (n=15 out of 18), while only 1 patient from respiratory medicine and 1 patient from neurology received such treatment. The single gastroentrology patient was also not managed using such pharmacotherapy. During the study period, 12 patients sustained an osteoporotic fracture (rheumatology = 7, respiratory = 3, neurology = 2, gastroenterology = 0). 100% of rheumatology patients who sustained an osteoporotic fracture were managed with antiresorptives, as opposed to 0% of respiratory and neurology patients.
Conclusion
In Malta, Rheumatologists excel when compared to non-Rheumatologists in the management of GIOP. This audit highlights the need for further liaison and communication between specialties, and the adoption of a multidisciplinary bone health initiative.

P1042

DAIRY INTAKE PATTERNS IN 50 YEARS AND OLDER IRANIAN POPULATION: INSIGHTS FROM A NATIONWIDE SURVEY

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Background: Consuming dairy products plays a crucial role in bone health among individuals. Considering the significance of dairy consumption for those aged 50 and older, this study seeks to evaluate the dairy intake habits of individuals 50 years old and above within the Iranian population.
Methods: Analysis was conducted using data from the 2021 WHO STEPwise approach to NCD risk factor surveillance (STEPS) survey, focusing on participants aged 50 and older (n=10883). Dairy consumption was categorized into three groups: less than once a day, one to two times a day, and more than three times a day. The study examined differences in these dietary habits in relation to gender, residence, and educational level. The Mann-Whitney U test and Jonckheere–Terpstra test for trend were utilized. STATA (v17) was applied for analysis.
Results: Overall, the result shows that dairy consumption is low among our target population. Approximately 60.9% of participants consumed dairy less than once a day, while 36.2% consumed 1-2 times a day, and only 2.9% reported consuming dairy three times a day or more. Gender did not significantly influence dairy consumption patterns (P-value = 0.683). Rural residents had a significantly higher dairy intake. The proportion of consuming three times and more was 4.6% and 2.4% in rural and urban areas, respectively (P-value < 0.001). Participants with lower education levels showed slightly higher dairy consumption; 3.2%, 2.8%, and 2.3% of people with 'less than 7 years', '7 to 12 years' and '12 years and more' of education, respectively, consume dairy three times or more (P-value < 0.001). This may due to the fact that less educated people live more in rural areas more and people in rural area tend to consume more dairy.
Conclusions: As the population of Iran continues ages, the prevalence of geriatric diseases, particularly osteoporosis, has become increasingly significant. Our findings highlight the necessity of paying special attention to dairy consumption, as it plays a critical role in bone health. Therefore, it is essential to implement policies to increase dairy intake among the elderly population.
Keywords: dairy intake, nutrition, bone, osteoporosis, old people

P1043

ABALOPARATIDE RAPIDLY IMPROVES BONE MINERAL DENSITY SUGGESTING PROMISE FOR PREOPERATIVE BONE HEALTH OPTIMIZATION

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Objective(s)
To evaluate the efficacy of subcutaneous abaloparatide (ABL) on markers of bone remodeling and bone mineral density (BMD) at 3, 6, and 12 months in men and women with osteoporosis.
Material and Methods
Lumbar spine, total hip and femoral neck BMD and bone turnover biomarker (CTX and P1NP) data from two randomized controlled trials assessing efficacy of 80 µg subcutaneous ABL on bone formation, at timepoints noted above, were utilized (n= 399). Mixed models were used to model mean percent change in BMD and the median percent change in turnover markers from baseline.
Results

Table 1: Percent Change from Baseline by Timepoint

Month	Men	Women
Femoral Neck BMD		
3	1.8	1.5
6	1.9	2.6
12	3.4	3.6
Hip BMD		
3	1.3	1.8
6*	1.7	2.8
12*	2.4	3.9
Spine BMD		
3	4.2	4.4
6*	6.7	7.9
12	9.5	10.7
CTX		
1	-2.8	2.7
3	28.3	24.6
6	49.0	36.8
12	35.0	24.2
P1NP		
1	130.7	133.7
3	93.3	102.4
6	109.7	114.5
12	80.9	68.1

BMD: Bone Mineral Density; CTX: C-terminal Peptide; P1NP: Procollagen Type I N-Propeptide

*Significant difference between men and women at p≤0.01

Conclusion(s)
ABL increased BMD at all measured sites at 3, 6, and 12 months in both men and women. Bone turnover marker data were concordant with the BMD data. Previous research demonstrated that total hip BMD increases as little as 1.42% at 24 months results in significant risk reduction of all clinical fractures.[1] In this analysis, ABL treatment met or exceeded this threshold at all timepoints in women and at 6 and 12 months in men. This rapid response may reduce or eliminate surgical delay while still providing improved bone status. Thus, ABL shows promise for use in bone health optimization prior to elective orthopedic surgery in patients with osteoporosis.
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Disclosures
Data were obtained in collaboration with Radius Health.

P1044

ABALOPARATIDE INCREASES DISTAL FEMUR BMD POST TOTAL KNEE ARTHROPLASTY

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Objectives: Osteoporosis is common in total joint replacement patients and increases risk for adverse outcomes. Existing data indicate that total knee arthroplasty (TKA) leads to rapid distal femur bone loss. We hypothesized that abaloparatide (ABL) would mitigate this loss. The study's purpose was to evaluate the effect of ABL begun prior to TKA on distal femur BMD.
Materials and Methods: Female and male TKA candidates age ≥ 55 yrs were enrolled in this open-label 18-mo study. Those with clinical osteoporosis, defined as T-score ≤ -2.5 or < -1.0 if prior low-trauma fracture, received daily ABL. Subjects with osteopenia, but without fracture, comprised an untreated control (CON) group. BMD was measured by DXA at the L-spine, total hip, radius and 2 distal femur regions of interest (ROIs) placed at 15% and 25% of femur length at screening (~3 mo pre-TKA), 1-week pre-TKA, 6-mo and 15-mo post-TKA. Groups were compared at baseline by t-test. For this completers analysis (n = 21 ABL/27 CON) BMD change at all measured sites was assessed by ANOVA.
Results: At baseline (n = 58; 29 ABL/29 CON) sex, mean (SD) age and BMI did not differ between ABL and CON groups; 3 vs. 6 male, 70.5 (7.2) vs. 68.6 (7.1) years and 31.3 (6.1) vs. 31.0 (4.7) kg/m^2 respectively. ABL group baseline BMD was lower ($p \leq 0.05$) at all sites except the L-spine. ABL was dosed for 96 (60) days prior to TKA. In the CON group, BMD declined ~1-2.5% ($p < 0.05$) at the 15% and 25% ROI by 15-mo post TKA.
Distal femur BMD increased at the 15% and 25% sites in ABL group from baseline and differed from CON ($p < 0.05$) at pre-surg, 6 and 15 mo post-surg (Table). L-spine and total hip BMD also increased by 6-mo in the ABL group (Table). BMD percent change at 15% and 25% distal femur ROIs was ~double in the surgical

compared to non-surgical leg, (up to 4%; p > 0.05), but did not differ at the total hip.

Conclusion: In osteoporotic TKA recipients, ABL increased BMD at the distal femur, L- spine and total hip compared with osteopenic controls. Abaloparatide improves BMD in osteoporotic patients undergoing TKA. The decrease in distal femur BMD after TKA among controls was less than previously reported, thus, further study to clarify the effect of TKA on distal femur BMD is needed.

BMD % Difference from Baseline Between ABL and CON Groups

	Pre-Surg			6-mo			15-mo		
	Abl	Cont	Diff	Abl	Cont	Diff	Abl	Cont	Diff
L1-4	2.4	0.9	1.5*	6.2	1.4	4.8§	11.7	2.6	9.1§
Total Hip	3.1	0.1	3.0*	4.0	-1.6	5.6§	6.2	-1.1	7.3§
0.3 Radius	0.7	0.0	0.7	-1.3	-1.0	-0.3	-3.0	-0.8	-2.2*
15% DF	1.4	-0.5	1.9	9.1	2.3	6.8§	8.5	-1.0	9.5§
25% DF	0.7	-0.1	0.8	3.1	-1.6	4.7†	3.9	-2.4	6.3§

Abl = abaloparatide; Cont = Control; Diff = Difference; DF = distal femur

* = p ≤ 0.05; † = p ≤ 0.01 and § = p ≤ 0.001

P1045

CHANGES IN BODY COMPOSITION ASSESSED WITH BIOELECTRICAL IMPEDANCE IN TRANSGENDER PATIENTS AFTER 12 MONTHS OF AFFIRMATIVE HORMONE THERAPY IN A HEALTH INSTITUTION IN COLOMBIA

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Objetivo: Describir los cambios en la composición corporal en pacientes transgénero que recibieron hasta 12 meses de terapia hormonal afirmativa y fueron atendidos en el Hospital San José (Bogotá – Colombia) entre 2019 – 2023.

Materiales y métodos: Estudio descriptivo de una cohorte histórica de pacientes mayores de 18 años en terapia hormonal afirmativa por al menos 12 meses de forma continua y evaluados con impedancia bioeléctrica. Los parámetros fueron obtenidos mediante un equipo OMRON modelo HBF-514C, incluyendo IMC (Índice de Masa Corporal), porcentajes de músculo, grasa total y niveles de grasa visceral. Cada uno de los anteriores fueron extraídos de mediciones tomadas antes del inicio del tratamiento (día cero) y posteriormente agrupados en intervalos de (0-3 meses), (3-6 meses), (6-12 meses). Los datos fueron recolectados de las historias clínicas de los pacientes atendidos desde junio de 2019 hasta junio de 2023 en seguimiento por el servicio de endocrinología del Hospital de San José en Bogotá, Colombia. Se excluyeron los pacientes que suspendieron la terapia hormonal, iniciaron terapia hormonal automedicada antes de las mediciones de las variables de interés, diagnóstico previo de trastornos alimentarios no controlados, enfermedad coronaria y apnea del sueño. Se comparó el punto cero con un año mediante la prueba de Wilcoxon. Los cambios en todas las mediciones a lo largo del tiempo se exploraron con la prueba de Friedman y, en caso de diferencias, se realizó un análisis post hoc con la prueba de Durbin Conover.

Todas las pruebas de hipótesis se realizaron con un alfa de 0,05 y un 95% de confianza. La información fue procesada y analizada en el software estadístico Jamovi® versión 2.3.

Resultados: Cincuenta y nueve pacientes con una mediana de edad de 23 años (RIC 21-29) cumplieron los criterios de selección, el 64% de los pacientes (n=38) eran hombres transgénero. El 100% (n=59) tenía diagnóstico de disforia de género confirmado por un equipo multidisciplinario. La mediana del IMC fue de 23,3 kg/m2 (RIC 20,4-25,0) y la mediana del peso fue de 60,3 kg (RIC=53,2-71,0).

Las mujeres transgénero habían recibido estrógenos conjugados 76,1%, valerato de estradiol 9,52%, parches de estradiol 9,52% y estradiol en aerosol 4,76%. El cien por ciento (n=38) de los hombres transgénero recibieron undecanoato de testosterona como tratamiento.

Todos los pacientes transgénero solo mostraron aumentos estadísticamente significativos en el IMC (p=0,031) sin variación relevante en otras variables al realizar pruebas t. Los hombres transgénero mostraron cambios con aumentos en los niveles de masa muscular cuando se compararon los resultados a los 0 meses y a los 6-12 meses (p=0,001) sin modificación en la masa grasa y la grasa visceral. Por otro lado, las mujeres transgénero presentaron ganancia en la masa grasa y disminución en la masa muscular cuando se compararon los resultados a los 0 meses y a los 6-12 meses (p=0,005) y (p=0,004) después de doce meses de tratamiento.

Discusión: En nuestro estudio podemos confirmar lo descrito en la literatura mundial; después de 12 meses de terapia hormonal afirmativa, se evidencian aumentos en los porcentajes de masa muscular en hombres transgénero y de masa grasa en mujeres transgénero, acercándose a la distribución corporal típica de hombres y mujeres cisgénero.

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P1047

WEIGHT, HEIGHT, BMI AND THEIR ASSOCIATION WITH FRACTURE RISK: AN INTERNATIONAL META-ANALYSIS

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Objectives

In a recent Mendelian Randomisation analysis height was causally associated with incident fracture independently of body mass index (BMI) [ref]. Any implications of this finding for risk assessment are not clear. In this international meta-analysis, we investigated the independent predictive value of weight, height and BMI for incident fracture in women and men.

Materials and methods

The interim analysis dataset comprised individual records of 672,282 women and men from 38 cohorts with information on weight, height, BMI and incident fractures. The total follow-up time was 7.1 million person-years. We investigated associations between baseline measures (as continuous variables) and risk of major osteoporotic fracture (MOF) using an extended Poisson model in each cohort. The covariate adjustments were age and duration of follow-up. Results from the different cohorts were merged using the inverse-variance weighted β-coefficients in random effects models.

Results

After adjustment for age, time since baseline and height, higher BMI was associated with lower risk of incident MOF in both women [hazard ratio (HR) (95% CI) per 1 kg/m^2: 0.97 (0.96-0.99)] and men [0.98 (0.97-1.00)] (Table). Similar BMI associations were demonstrated when adjusted for weight instead of height in women [HR (95% CI) per 1 kg/m^2: 0.96 (0.95-0.98)] and men [0.97 (0.94-1.01)]. When height was adjusted for age, follow-up time and BMI there were no statistically significant associations with incident MOF [women HR (95% CI) per 1 cm: 1.00 (1.00-1.01); men 1.00 (0.99-1.01)]. The same was true for weight [women HR (95% CI) per 1 kg: 1.01 (1.00-1.01); men 1.00 (1.00-1.01)].

Conclusions

In one of the largest ever meta-analyses undertaken to date, higher BMI was associated with lower major osteoporotic fracture risk when adjusted for height and weight. In contrast, neither height nor weight adjusted for BMI was statistically significantly related to incident fracture risk. These findings will inform the next iteration of the FRAX® calculator.

Table. Hazard ratios for hip and major osteoporotic fracture (MOF) [+ 95% confidence intervals] by baseline height, weight and BMI per 1 unit change (cm, kg and kg/m^2) (adjusted for age and follow-up time). Associations in bold denote p<0.05

		Outcome: MOF
BMI adjusted for height	Women	**0.97 (0.96-0.99)**
	Men	**0.98 (0.97-1.00)**
Height adjusted for BMI	Women	1.00 (1.00-1.01)
	Men	1.00 (0.99-1.01)
BMI adjusted for weight	Women	**0.96 (0.95-0.98)**
	Men	0.97 (0.94-1.01)
Weight adjusted for BMI	Women	1.01 (1.00-1.01)
	Men	1.00 (1.00-1.01)

Reference: Nethander et al. (2023) An atlas of genetic determinants of forearm fracture. Nat Genet. Nov;55(11):1820-1830

P1048

OSTEOPOD: IMPLEMENTATION OF SECONDARY FRACTURE PREVENTION SERVICE IN IRAN

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Objective:
Osteoporosis remains a critical healthcare challenge in Iran, imposing an economic burden of 2165 million US$ purchasing power parity 2020 (1). To mitigate the elevated risk of secondary fractures following an initial osteoporotic fracture, the Fracture Liaison Service (FLS) program, endorsed by the International Osteoporosis Foundation (IOF), was launched in 2020 as "Osteopod." This initiative focuses on systematic patient identification, treatment initiation, and long-term monitoring. This abstract shows the current status of this prevention program in Iran.

Material and Methods:
A collaborative team from the Ministry of Health (MOH) and the Endocrinology and Metabolism Research Institute (EMRI) at Tehran University of Medical Sciences developed Iran's national Osteopod protocol in 2019, aligned with IOF guidelines. The protocol emphasizes a four-step framework: identifying at-risk patients, investigating lifestyle and fall risks, initiating evidence-based treatments, and following up through a dedicated digital platform. The software tracks patient outcomes, including falls, fractures, and mortality, while enabling nationwide data collection for research. EMRI-led workshops train clinic personnel to standardize practices. Continuous feedback has refined the protocol and software, supporting nationwide scalability.

Results:
Five Osteopod clinics are now operational in Tehran, Gorgan, Sari, Shiraz, and Hamedan, with all five recognized on the IOF's Best Practice Map. These clinics have earned gold, silver, and bronze medals for adherence to global standards. To date, 4,700 patients (68.1% women; mean age 65.9 years) have been registered. Analysis of fracture types revealed the following distribution: hip fractures (23.3%), vertebral fractures (1.4%), and other fractures (75.4%). Among the "other fractures," the most common sites were the radius (25.6% of total fractures), and humerus (12.3%), with the remaining 37.5% comprising other fracture sites (see Figure 1). The mean age of patients with hip fractures was significantly higher than those with other fracture types (72.5 vs. 63.6 years, p<.001).

Conclusions: The Osteopod program has successfully transitioned from pilot to national expansion, demonstrating scalability within Iran's healthcare system. Collaboration between MOH and EMRI has enabled standardized, multidisciplinary care for osteoporosis patients, reducing secondary fracture risks. With all five clinics achieving IOF recognition and a growing patient registry, the program serves as a model for low- and middle-income countries. Future efforts will prioritize further geographic expansion, integration with primary care, and research leveraging the program's comprehensive database.

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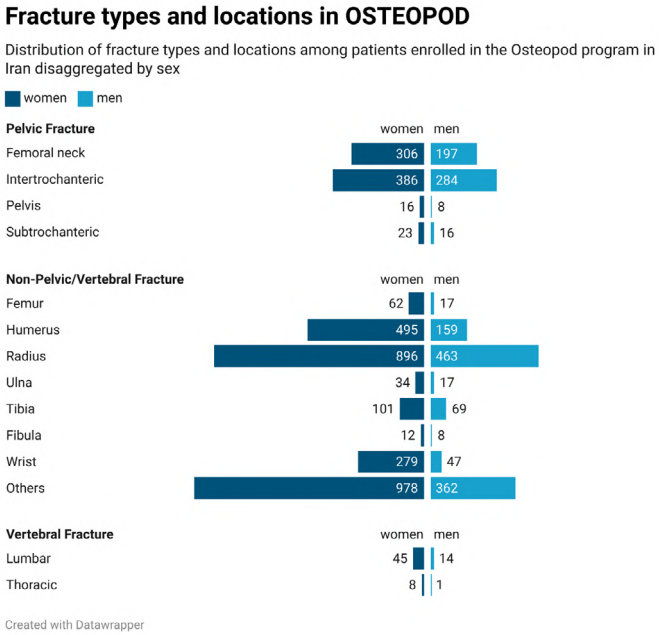

Figure 1. Distribution of fracture types and locations among patients enrolled in the Osteopod program in Iran.

P1049

PREVALENCE AND RISK FACTORS OF VERTEBRAL FRACTURES IN IRANIAN OLDER ADULTS: FINDINGS FROM IRANIAN MULTICENTER OSTEOPOROSIS STUDY (IMOS)

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Objective: Understanding vertebral fractures (VF) is crucial, as a person who has experienced one fracture is at greater risk for future fractures, and many vertebral fractures occur without clinical symptoms. This study aimed to estimate the prevalence of VF and identify the associated risk factors within a representative population-based sample.

Material and Methods: This cross-sectional study, conducted as part of the Iranian Multicenter Osteoporosis Study (IMOS 2021-2022), involved participants aged 50 and older. The study employed dual-energy X-ray absorptiometry (DXA) to measure bone mineral density (BMD) and utilized vertebral fracture assessment (VFA) techniques to identify the presence of vertebral fractures (VFs). Osteoporosis was defined according to established criteria, specifically as a T-score of ≤ -2.5 in either the hip or lumbar spine. Additionally, the trabecular bone score (TBS) was evaluat-

ed in the lumbar spine using the TBS iNsight™ software. Furthermore, we employed multiple logistic regression models to analyze the relationship between vertebral fractures and a range of associated risk factors.

Results: The study included 1,441 (54.4% women) participants, who underwent VFA. A total of 623 VFs were identified, with 330 in women and 293 in men. The overall prevalence of VFs was 43.2% (95% CI: 40.6% - 45.8%), with a prevalence of 43.9% in men and 53.7% in women (P=0.079). Among women, 52.7% of the fractures were classified as mild, 37.6% as moderate, and 5.36% as severe. In men, the corresponding figures were 60.7%, 34.7%, and 4.6%, respectively. The types of fractures observed included wedge fractures (61.6% in women, 65.5% in men), biconcave fractures (31.2% in women, 30.5% in men), and crush fractures (7.2% in women, 4.1% in men). Key factors associated with VFs in women included age (OR: 1.01, 95% CI: 1.00-1.02, P: 0.039), current or former smoking (OR: 1.35, 95% CI: 1.00-1.83, P: 0.049), and history of fall (OR: 1.24, 95% CI: 1.02-1.51, P: 0.026). In contrast, for men, having more than 12 years of education was a significant predictor of lower odds of the VF (OR: 0.57, 95% CI: 0.41-0.79, P: 0.001).

Conclusion: This study reveals a notable prevalence of vertebral fractures, particularly among women. These findings highlight the need for tailored prevention strategies to target VFs, especially the non-clinical ones.

P1050

BONE FORMATION MARKER P1NP IN OLDER ADULTS: A COMPREHENSIVE SYSTEMATIC REVIEW AND META-ANALYSIS

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Objective

The Procollagen Type 1 N-terminal Propeptide (P1NP) serves as a vital biomarker for evaluating bone formation. This study aimed to establish P1NP levels to improve diagnostic and therapeutic approaches for assessing bone health.

Materials and Methods

A systematic literature search was conducted across various databases up to April 15, 2023, targeting articles that measured serum P1NP levels in healthy individuals aged 50 and older. After eliminating duplicates, two reviewers assessed the titles and abstracts of potentially relevant studies. Data were collected on authorship, publication year, sample size, laboratory kits utilized, participants' fasting status, sex, and serum P1NP levels using a pre-designed data sheet. The risk of bias was evaluated using the Newcastle-Ottawa checklist, and pooled mean P1NP levels were calculated with Stata software, while statistical heterogeneity was analyzed via Cochran's Q test and the I^2 statistic.

Results

From an initial pool of 11,011 studies, 49 met the inclusion criteria after screening and removing 4,227 duplicates. The pooled P1NP levels were found to be 39.6 ng/mL for males and 48.5 ng/mL for females, resulting in a combined level of 46.5 ng/mL. In fasting conditions, P1NP levels were 40.0 ng/mL for males and 49.7 ng/mL for females. Funnel plot analysis indicated potential publication bias, yet the overall quality of the studies was deemed generally strong.

Conclusion

This study underscores the importance of determining sex-specific P1NP values, revealing that elevated P1NP levels in women are linked to an increased risk of osteoporosis.

P1051

INCIDENCE OF FALL-RELATED FRACTURE IN WOMEN OVER 50 YEARS: INSIGHTS FROM A BONE DENSITOMETRY CLINIC

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Objective: The aim of this study is to investigate the cumulative incidence of fractures in women over 50 years of age who underwent bone mineral density (BMD) measurements in a clinic within one year.

Methods: We collected data from the bone mineral densitometry clinic in Tehran, Iran between 2022 and 2023. Demographic information, previous medical history, BMD status and body mass index (BMI) were extracted from the participants' medical records. Information on fractures in the last year and receiving osteoporosis medication was collected through telephone interviews. The incidence of fall-related fractures was calculated in all women, based on the BMI and BMD status.

Findings: A total of 373 eligible women with a mean age of 64.7±7.2 years were included in the study. Osteoporosis and osteopenia were detected in 80 (21.4%) and 199 (53.3%) of the women, respectively. The overall incidence of new fall-related fractures among the participants during the one- year period was 5.09% (95%CI: 3.31-7.85). Regarding the BMD status, the highest number of fall-related fractures was observed in the osteopenia group in eight cases (4.02%, 95%CI: 2.01-7.84). In terms of BMI, 2.27% (95%CI:0.73-6.83) of the normal-weight women, 7.01% (95%CI:3.91-12.20) of the overweight group, and 5.95% (95%CI:2.49-13.54) of the obese group reported fall-related fractures during one year. A higher, but not statistically significant, incidence rate was observed in the group eligible for osteoporosis treatment (7.92%, 95%CI:4.0-15.0) in comparison to the other group (4.04%, 95%CI: 2.24-7.16). The incidence of fall- related fractures was higher in women on hormone therapy (9.2% ,95%CI:4.63-17.32), than in the others (3.8%, 95%CI:2.13-6.82).

Conclusion: Considering the incidence and complications of fractures in elderly populations, encouraging timely diagnosis, medication adherence and maintaining a healthy behavior can significantly contribute to reducing fracture rates in this high-risk population.

Keywords: Fracture incidence, elderly women, osteoporosis, fall

P1052

COST-EFFECTIVENESS ANALYSIS OF FRACTURE LIAISON SERVICES IN IRAN

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Objective: This study aimed to assess the cost-effectiveness of a Fracture Liaison Service (FLS) program compared to current practice in Iran, from a healthcare system perspective.

Material and Methods: The target population was patients aged 50 years or older with recent sentinel fragility fractures. Data were collected using various resources, including previously published literature, treatment guidelines, and hospitals. A state-based microsimulation model with a lifetime horizon and the perspective of the healthcare system was designed to estimate the cost-effectiveness of an FLS compared to current practice by simulating costs and quality-adjusted life years (QALYs (. In this study sentinel and subsequent fractures were categorized into hip, spine, or major fractures at other sites. Treatment pathways for patients under current practice and FLS were compared using incremental cost-effectiveness ratios (ICERs).

Results: For patients aged 50 years and older with a sentinel fragility fracture, FLS was associated with an additional cost of $177 and a gain of 0.05 QALYs compared to current. Consequently, the ICER was estimated at $3,662 per QALY gained, which is below the willingness-to-pay (WTP) threshold of one GDP per capita ($4,503 per QALY), indicating that FLS is cost-effective relative to current practice. Furthermore, simulations involving patients with a recent fracture showed that FLS led to a reduction of 60 fractures and 6.7 deaths due to fractures per 1,000 patients compared to current practice. The one-way sensitivity analysis indicates that the relative risk of fracture reduction with anti-osteoporosis medication, cost of medication treatment, discount rate, and hip and other fracture treatment costs have the most impact on the ICER. The acceptability curves show that at the WTP threshold of one GDP per capita of Iran, 69% of the simulations indicate that the

FLS was cost-effective compared to current practice. When the WTP threshold increased to two GDP per capita, the probability of the FLS strategy being cost-effective rose to nearly 100%.
Conclusion: The findings of this study demonstrate that FLS is cost-effective compared to current practice in Iran. Given the significant incidence of osteoporotic fractures and the increasing aging population in Iran, these results underscore the potential of FLS to enhance patient outcomes.

P1053

THE PREVALENCE OF CO-OCCURRENCE OF FEAR OF FALLING AND AVOIDANCE BEHAVIORS DUE TO FALLS IN PEOPLE AGED 50.

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Objective: This study aims to determine the prevalence of co-occurrence of fear of falling (FOF) and falling avoidance behaviors (FFAB)in people over 50 years of age.

Methods: This cross-sectional study was conducted on individuals over 50 years of age who performed bone mineral density (BMD) in a BMD clinic in Tehran, Iran, between 2022 and 2023 . The demographic data of individuals was collected from their medical records. The validated FOF questionnaire with seven questions (total score: 0-16) and the FFAB questionnaire with 14 questions (total score: 0-54) were used considering the standard cut-off points for categorization. High fear of falling, and high fall-avoidance behaviors were defined as score>15, and score>20, respectively. Data on other variables of interest and fall experiences in the past year were collected through telephone interviews with the participants.

Results: Of the 425 (87.2% women) participants with the mean age of 64.2 years,), 93 (21.8%; 95%CI: 18.2-26.0) reported FOF, and 68 people (16.0%: 12.8-19.8) reported FFAB. In all, 52 (12.2%: 9.4-15.7) participants reported high levels of fear of falling and avoidance behavior at the same time. This co-occurrence was higher in men (17.3%) than in women (11.5%) but the difference was not statistically significant (p=0.233). The co-occurrence was also more prevalent in individuals aged over 70 years (32.9%: 24.2-43.1), compared to people aged 60-70 years (8.0%: 5.1-12.4) and who aged 50-60 years (2.8%: 1.0-8.3). People taking medication for type 2 diabetes were more likely to report this co-occurrence than others (16.3%: 11.8-22.4, p=.014). Also, participants with cardiovascular diseases showed a higher prevalence compared to the healthy ones (37.8%: 22.3-56.) vs. (10.3%:7.7-13.7), p<0.001). Visual and hearing impairments increased the likelihood of this co-occurrence compared to the general population by respectively, p<0.001). Spontaneous falls in the past year and living alone also increased the likelihood of FOF and FFAB co-occurrence by (26.3%:18.4-36.0) and 21.3% (95%: 12.7-33.), respectively, p<0.001).
Conclusion: The simultaneous occurrence of a high fear of falling and fall-avoidance behavior is notably prevalent among individuals older than 60 years. The high prevalence of this co-occurrence is linked to cardiovascular disease, diabetes medication, sensory impairments, and past falls experiencing.
Key word; Fall, FOF, Avoidance behavior, elderly, cooccurrence

P1054

UKRAINIAN GUIDELINE FOR THE MANAGEMENT OF GLUCOCORTICOID-INDUCED OSTEOPOROSIS - 2024

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Background. Glucocorticoid-induced osteoporosis (GIOP) is a bone metabolic disease caused by chronic glucocorticoid (GC) use. It is one of the leading causes of secondary osteoporosis, which significantly increases the risk of low-trauma fractures and impacts disability and mortality among patients. Although few studies on GIOP epidemiology and treatment have been conducted in Ukraine, national guidelines for GIOP management have been lacking until now.
The **aim** was to create national guideline for the diagnosis, prevention, and treatment of GIOP based on an analytical review of modern literature, raising awareness among the Ukrainian medical community, enhancing GIOP management, and reducing the

disease's socio-economic impact.
Materials and Methods. To develop this guideline, a team of 18 leading Ukrainian experts from various fields was formed. Six experts from the Working Group analyzed current literature on GIOP epidemiology, risk factors, diagnosis, prevention, treatment, and monitoring. Evidence was synthesized using the GRADE system, while the quality of recommendations was critically assessed with the AGREE II tool. Two rounds of voting were performed in 2024.
Results. The current guideline comprises 12 key statements covering GIOP screening, diagnosis, prevention, and treatment. It highlights the importance of educating the Ukrainian medical community and patients about the risks of chronic GC use. The document provides detailed recommendations for assessing osteoporotic fracture risks in GC users (using FRAX and DXA) and outlines modern, locally available GIOP diagnosis (DXA, USD, etc.) and treatment methods.
Conclusion. The first Ukrainian guideline for GIOP management offers a significant national framework for screening, diagnosis, prevention, and treatment of this disease. The Board of the Ukrainian Association of Osteoporosis endorses it for implementation in clinical practice by physicians across various specialities.
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P1055

THE ANTHROPOMETRIC EQUATIONS FOR SCREENING OF LOW APPENDICULAR SKELETAL MUSCLE MASS IN OLDER UKRAINIANS

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Background. Sarcopenia, a prevalent age-related condition, contributes to increased disability and reduced life expectancy of older subjects. Current sarcopenia guidelines employ assessment of muscle mass by measuring the appendicular skeletal muscle mass (ASM) using dual-energy X-ray absorptiometry (DXA) or bioelectrical impedance analysis. However, the limited availability of DXA in Ukraine hinders in-time sarcopenia diagnosis. Previous studies proposed different ASM prediction equations based on demographic and anthropometric data, offering a more accessible and cost-effective alternative for improving sarcopenia diagnosis. However, similar equations have not been present for Ukrainians until now.
This study **aimed** to create and validate ASM prediction equations for the Ukrainian population using simple demographic and anthropometric indices.
Materials and Methods. The study included 1,606 adults aged 60-91 years. Subjects were randomly divided into 2 groups: a model development group (n=1406, 1,262 women and 144 men) and a cross-validation group (200 women). ASM was measured by DXA (Hologic), and anthropometric parameters included body weight, height, and waist and hip circumferences. Demographic data included participants' age and menopausal status for women. Using multiple regression analysis, ASM was treated as the dependent variable, while demographic and anthropometric variables were independent.
Results. The final ASM equations for both sexes (1), males (2) and females (3) were created:
ASM (1)=0.165×weight (kg)+0.096×height (cm)−4.939×gender*−0.0205×age (years)+1.877
Note. * - 1 - females and 2 - males.
ASM (2)=0.191 weight (kg)+0.141×height (cm)−0.077×age (years)−9.406
ASM (3)=0.161×weight (kg)+0.089×height (cm)−0.013×age (years)−7.067
The models showed high multiple correlation (R1=0.90, R2=0.84 and R3=0.84) and determination coefficients ($R^2$1=0.81, $R^2$2=0.71, $R^2$3=0.71, for all equations p<0.00001). In the cross-validation group, the difference between calculated and DXA ASM indices was most minor for formula 3 (Min-Max: [-4.7–2.2]).
Conclusion. The developed ASM prediction equations demonstrated substantial prognostic accuracy and can significantly enhance sarcopenia diagnosis in the Ukrainian population.

P1056

SARCOPENIA AND BONE HEALTH PARAMETERS IN POSTMENOPAUSAL WOMEN WITH DIFFERENT TYPES OF OSTEOPOROTIC FRACTURES

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The research **aim** was to study sarcopenia and bone health parameters depending on the presence of various osteoporotic fractures in postmenopausal women.
Materials and Methods.
In the single-centre study, we examined 139 females aged 51-87 years (mean age 69.2±7.8 years), divided into three groups: 1 - healthy subjects without any previous fractures (n=50), 2 - patients with previous forearm fractures (FFs, n=39) and women with previous vertebral fractures (VFs, n=50).
Anthropometric measurements, including height, weight, and body mass index, were obtained using standard clinical methods. Muscle strength was evaluated using hand dynamometry and the "sit-to-stand" test. Muscle mass (appendicular muscle mass (ALM) and appendicular muscle mass index) was determined using dual-energy X-ray absorptiometry (DXA, Hologic). The diagnosis of sarcopenia was confirmed using EWGSOP2 criteria. Also, by DXA, we measured bone mineral density (BMD) in the lumbar spine (LS), femoral neck (FN), total hip (TH) and radius as well as

trabecular bone score (TBS).

Results.

The examined did not differ in age, main anthropometric parameters (height, weight and body mass index) and menopausal status (menopause age and duration of postmenopausal period). However, the increased risk of confirmed sarcopenia was revealed in the patients with VFs (OR=2.71, 95% CI: 1.02-7.20; p = 0.045) but not in subjects with FFs (OR=0.60, 95% CI: 0.18-1.95; p=0.40). FN and TH BMD were significantly lower in patients with various osteoporotic fractures (FN BMD - group 1: 0.70±0.14; group 2: 0.63±0.10; group 3: 0.61±0.09 g/cm^2, respectively, F=9.96; p=0,00009) whereas LS BMD and TBS were reliable lower only in subjects with VFs (LS BMD - group 1: 0.89±0.19; group 2: 0.83±0.16; group 3: 0.80±0.14 g/cm^2, respectively. TBS - group 1: 1.23±0.10; group 2: 1.21±0.08; group 3: 1.17±0.10 un., respectively). We did find significant differences in radius BMD and ALM parameters depending on the presence and types of osteoporotic fractures. Also, we did not reveal reliable differences in muscle strength parameters between patients from the study groups.

Conclusion.

Patients with VFs have lower bone strength and quality, as well as an increased risk of sarcopenia compared to subjects without previous fractures, which should be counted in their management.

P1057

AWARENESS LEVELS AMONG INDIAN FEMALES ABOUT POST MENOPAUSAL OSTEOPOROSIS: A CROSS-SECTIONAL STUDY FROM NORTHERN INDIA

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Background

Osteoporosis can be prevented by imparting knowledge to the general population. To address this, we assessed the knowledge among the population by a survey involving female population aged 25-45 years.

METHODS

Between May 2024 and November 2024, a cross-sectional study was done in Delhi, India. A total of 2000 healthy females aged 25-45 years, all graduate participated in the study. The Osteoporosis Knowledge Assessment Tool (OKAT) was used to assess the knowledge of osteoporosis amongst the females.

Results

The mean age was 33.1±2.7 years. The mean score for osteoporosis awareness was 7 out of 20 points. A total of 1698 (85%) had no knowledge about osteoporosis with most of them scoring 2-3 points on OKAT scale.

Conclusions

Even among educated women of Pitampura, Delhi knowledge, attitudes, and behaviors about osteoporosis were found to be quite low. In addition, education and mass communications are needed to increase awareness among women about improving bone health.

P1058

RELAPSED PAGET'S DISEASE OF THE BONE: CLINICAL PRESENTATION, PREDICTORS AND THERAPEUTIC RESPONSE

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Background and Objectives: Bisphosphonate therapy has revolutionised the management of Paget's disease of bone. However, 3 to 15% of these patients have been reported to relapse during follow-up. We describe the clinical presentation of patients with Relapsed Paget's Disease of Bone(RPDB), their predictors and response to therapy, from a single quaternary centre in southern India.

Material and Methods: This observational study analysed the clinical features, biochemical profile, and treatment outcomes of patients diagnosed to have RPDB from 2010 to 2016. A diagnosis of RPDB was made in previously treated patients with a documented remission who had biochemical worsening(elevated serum alkaline phosphatase) with or without clinical(recurrence of bony pain) and radiological deterioration, during follow up. The data was captured through the hospital Computerized Hospital Information and Processing System. The predictors of relapse were derived in comparison to 41 patients without relapse from a previously published series from our centre(Cherian et al, 2018). An ethics approval was obtained for this study.

Results: A total of 7 patients(6 men) were diagnosed to have RPDB. The mean(SD) age at diagnosis was 69.1(16.3) years. 28.7 percent(2/7) were asymptomatic. Pain was the predominant presenting symptom and all RPDB patients had a polyostotic involvement. 85.7 percent(6/7) were initially treated with oral bisphosphonates. The mean(SD) duration of developing relapse after initial treatment was 55(27.3) months. In comparison to those who did not relapse(n=41), patients with RPDB were significantly older, were treated with oral bisphosphonates and had a lower serum 25(hydroxy) vitamin D($p<0.01$). All RPDB attained remission with intravenous bisphosphonates.

Conclusion: RPDB can occur after several months of initial treatment and hence warrants long term follow-up. Patients who relapse were likely to be older, those treated with oral bisphosphonates and who have a lower vitamin D level.

P1059

THE UTILITY OF KNEE JOINT DXA (DUAL-ENERGY X-RAY ABSORPTIOMETRY) IN POSTMENOPAUSAL WOMEN WITH SEVERE OBESITY AND KNEE OSTEOARTHRITIS – A NOVEL ASSESSMENT STRATEGY

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The utility of knee joint DXA (Dual-energy X-ray Absorptiometry) in postmenopausal women with severe obesity and knee osteoarthritis – A novel assessment startegy

Background
Obesity is a major reversible public health problem of the 21st century associated with significant morbidity and mortality. Traditionally, it has been proposed that obesity is protective for the bone. However, those with severe obesity have poor bone quality, a higher risk of hip fracture, poor fracture healing, and an increased knee osteoarthritis risk, further contributing to poor quality of life. Protocols for knee DXA scans have been published before. However, the impact of severe obesity on knee BMD and its relation to severe osteoarthritis has not been studied, and the study helps address this research gap.
Aims and objective
To assess the impact of osteoarthritis severity on BMD at the knee joint in post-menopausal women with severe obesity. To also study the Dual Energy X-ray Absorptiometry (DXA) derived parameters at conventional sites in addition to the trabecular bone score and hip structural analysis in this study population.
Material and Methods
The study included 160 subjects - 80 ambulatory postmenopausal women who have morbid obesity cases, whose characteristics were compared with 80 age-matched postmenopausal women who have normal BMI. The prevalence of osteoporosis, low trabecular bone score (an index of degraded microarchitecture), and hip structural analysis of postmenopausal women were studied and compared to age-matched women with normal BMI. The impact of osteoarthritis on BMD at the knee joint with DXA scan in those with or without knee osteoarthritis was assessed separately. The osteoarthritis grading was assessed using WOMAC scoring and ACR criteria.
Results
The mean (SD) age of our study population was 55.7(5.4) years and the mean BMI was 40.1(4.2) kg/m2. In this study, the mean age of menopause was 45 years. The physical activity of the study subjects as assessed using GPAQ and quantified as MET (metabolic equivalent) in minutes. The mean (SD) MET score in the study population was 1062(191). The mean (SD) time spend sedentarily among cases was 161(80) minutes per day. 92.7% of the study population had pre-diabetes or type 2 diabetes mellitus and was on treatment. 41/80(51%) of the subjects had Vitamin D deficiency (<20 ng/mL). The mean value (SD) of 25(OH) Vitamin D was 22.01(10.4) pg/ml in cases and 23.6(9.3) in control group. The markers of bone resorption (CTX—429.5(225.4) vs 628.3(304.8) pg./ mL; P 0.102) and bone formation (P1NP—55.1(23.1) vs 62.1(29.7) ng/mL; P .102) were lower among postmenopausal women with morbid obesity as compared to age matched controls with normal BMI. The mean BMD at total Hip in cases were 0.715 (0.115) g/cm2, at lumbar Spine 0.984(.138) g/cm2. Mean (SD) TBS values in cases 1.095(0.181) & 1.143(0.059) in controls($p < 0.05$). The buckling ratio for the NN, FS and IT were 10.29 (3.33) ,2.75(0.53) &11.32 (2.48) which is statistically higher from that of controls. As per ACR Criteria 88.7% (71/80) of the study subjects has osteoarthritis knee. The severity of osteoarthritis was assessed by the radiological Kellgren and Lawrence scoring system. The cases were divided as with less severe and more severe Knee Osteoarthritis on the basis of the WOMAC score. The median WOMAC was 25. The cases were comparable for their baseline parameters. The mean (SD) BMI of cases with more severe OA were 42.7(5.6) kg/m2 & that of cases with less severe OA was 37.8(3.3) kg/m2. The BMD characteristics at the upper tibia (left and right) were significantly lower in cases with more severe osteoarthritis of the Knee Joint.
Conclusion
Post-menopausal women with morbid obesity have poor bone health in terms of bone density, trabecular bone score, and hip geometry and warrant periodic screening. Knee DXA can be considered as a surrogate to assess the severity of knee osteoarthritis. Further studies are needed to study its utility in predicting, diagnosing, and studying the impact of treatment.

P1060

ASSOCIATION BETWEEN FRACTURE RISK ASSESSED WITH FRACTURE RISK ASSESSMENT TOOL (FRAX) AND CHAIR STAND TEST IN GERIATRIC WOMEN

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Objective: Fractures are a major concern among elderly women, driven by age-related declines in bone density and functional mobility (1). The Fracture Risk Assessment Tool (FRAX) estimates 10-year fracture probabilities, while the Chair Stand Test evaluates lower body strength and mobility. This study aims to explore the association between FRAX-calculated fracture risk and Chair Stand Test performance to enhance fracture risk prediction.
Material and Methods:
This study examined the association between fracture risk and functional mobility using the Chair Stand Test (5XSST). 83 participants over 60 years were instructed to stand up and sit down from a chair five times consecutively as quickly as possible. Based on their performance, participants were categorized into two groups: 5XSST < 12.9 seconds (s) and 5XSST ≥ 12.9 s. Fracture risk was

assessed using the FRAX tool, which estimates 10-year probabilities of major osteoporotic (MOF) and hip fractures (HF). The relationship between 5XSST performance and FRAX scores was analyzed to identify variations in fracture risk across the two groups.
Results:
Out of 83 participants, 51 women (61.5%) had 5XSST < 12.9 s and 32 women (38.5%) had 5XSST ≥ 12.9 s. The mean age of the participants was 73 ± 5.3 years, and the mean BMI was 25.6 ± 4.3 kg/m². FRAX scores for MOF differed significantly ($p < .001$) across Chair Stand Test groups. Women with 5XSST ≥ 12.9 s had the higher mean FRAX score for MOF (24.39%), compared to those with 5XSST < 12.9 s (14.95%). Similarly, FRAX scores for HF also showed significant differences ($p < .001$) among Chair Stand Test groups. Women with 5XSST ≥ 12.9 s had the higher mean FRAX score for HF (10.03%), compared to those with 5XSST < 12.9 s (3.67%).
Conclusion:
The findings underscore the potential value of the 5XSST as a simple, practical tool for identifying individuals at higher risk of fractures, which could aid in early intervention strategies aimed at improving bone health and reducing fall-related risks.
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P1061

MIDDLE-AGED AND ELDERLY PATIENTS' PERCEPTIONS OF REHABILITATION TREATMENT AND FUNCTIONAL RECOVERY AFTER DISTAL RADIUS FRAGILITY FRACTURES: A QUALITATIVE STUDY

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Objective 1.To investigate patients' perceptions of rehabilitation treatment and functional recovery following distal radius fragility fractures through semi-structured interviews. 2.To provide novel insights for establishing best practice guidelines for conservative treatment and early postoperative rehabilitation of distal radius fragility fractures.
Methods A sample of 23 cases diagnosed with distal radius fragility fractures was collected from the Departments of Rehabilitation Medicine and Orthopedics at Peking University Third Hospital between October 2022 and January 2023. Using a semi-structured interview guide developed based on a review of relevant literature, semi-structured interviews were conducted with the sample. Audio and textual data were collected and subsequently transcribed and analyzed using MAXQDA2022 software for qualitative data analysis. The aim was to explore patients' perceptions regarding rehabilitation treatment and functional recovery post-fracture.
Results The study included a total of 23 participants, comprising 2 males (aged 53-56) and 21 females (aged 49-78). Through three levels of coding analysis, 50 initial categories, 14 main categories, and 5 themes were identified (1.The importance of fall risk assessment and prevention in middle-aged and elderly individuals;2.The significance of early intervention and continuous guidance in rehabilitation treatment;3.The importance of active participation by patients and their families in rehabilitation treatment;4.The necessity of providing psychological support therapy for middle-aged and elderly patients with DRF;5.The necessity of regularly assessing the functional status of the affected shoulder joint).
Conclusions This study indicates that early rehabilitation intervention and continuous guidance are perceived by middle-aged and elderly patients with distal radius fragility fractures as significantly beneficial for functional recovery and quality of life improvement. It is recommended that rehabilitation treatment for these patients comprehensively consider multiple factors, including pain, wrist joint function, psychological aspects, patient engagement, and shoulder joint function. Additionally, fall risk assessment and stratification should be conducted, and a multidimensional, personalized rehabilitation strategy should be employed to promote comprehensive recovery and facilitate an early return to normal life.

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VALIDATION OF THE CHINESE VERSION OF THE QUALITY OF LIFE QUESTIONNAIRE FOR DISTAL FOREARM FRACTURE

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Background: To evaluate the reliability and validity of the Chinese version of the IOF-Wrist scale in patients with distal radius fractures (DRF), a systematic validation study was conducted.
Methods: A total of 144 DRF patients were recruited for the analysis of internal consistency reliability, test-retest reliability, and criterion validity. Internal consistency was assessed using Cronbach's α, test-retest reliability was evaluated with intraclass correlation coefficients (ICC) calculated using a one-way random-effects model, and criterion validity was verified by analyzing correlations with VAS, DASH, and EQ-VAS.
Results: The overall Cronbach's α of the scale was 0.888, with 0.660 for the symptom domain and 0.855 for the function domain. The total score of the scale showed a single-measure ICC of 0.937 (95% CI: 0.892–0.964) and an average-measure ICC of 0.967 (95% CI: 0.943–0.981), $P < 0.001$. The criterion validity analysis demonstrated high correlations ($P < 0.01$) between the IOF-Wrist domains and the reference scales: 0.836 with VAS pain for the pain domain, 0.720 with DASH symptoms for the upper limb symptom domain, 0.887 with DASH function for the upper limb function domain, and 0.880 with EQ-VAS for the overall health status domain.
Conclusions: The Chinese version of the IOF-Wrist scale demonstrates good reliability and validity, making it an effective tool for assessing pain, function, and quality of life in DRF patients.

P1063

RISK FACTORS FOR BONE MINERAL DENSITY DISORDERS IN POSTMENOPAUSAL WOMEN

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Objective: Postmenopausal bone loss associated with estrogen deficiency is a major contributing factor to osteoporosis.
Material and Methods: To assess the prevalence of bone mineral density (BMD) disorders, a survey and examination of 172 women aged over 50 and under 70 years in Tashkent were conducted. A standardized questionnaire was completed for each participant, recording personal data, osteoporosis risk factors, laboratory results, and spine and proximal femur X-ray densitometry data. The average age of the participants was 58.5±6.7 years, the average age of menopause onset was 48.8±4.1 years, and the average BMI was 29.2±5.1 kg/m².
Results. It was found that nearly one-third (32.0%) of women experienced pain in various areas, while fractures were reported by 11.6% of participants. Family history of fractures was present in 14.5% of cases. Calcium and vitamin D supplements were taken by 16.9% and 37.8% of women, respectively, with the average daily calcium intake being 527.4±182.1 mg, and vitamin D intake 14,226±29,047 IU.
Almost half (47.1%) of the women consumed a sufficient amount of dietary calcium, while more than one-third (36.0%) excluded dairy products from their diets. In the overall cohort, just over half (53.5%) led an active lifestyle, while 27.9% were physically inactive.
When asked if they wore open clothing (short-sleeved tops and skirts above the calves), 67.4% answered "yes," 17.4% preferred moderately open clothing, and 15.1% wore fully covered clothing. More than one-third (34.9%) of the surveyed women consumed coffee, strong tea, and carbonated beverages, exceeding three cups per day.
Conclusion(s): Thus, one in three surveyed women has one or more risk factors for developing osteoporosis.

P1064

INTERLEUKIN-4 AND INTERLEUKIN-13 MODULATION IN ATOPIC DERMATITIS AND ITS ASSOCIATION WITH OSTEOPOROSIS

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Objective :Atopic dermatitis (AD) is a chronic inflammatory skin disease, primarily driven by Th2 cytokines like interleukin-4 (IL-4) and interleukin-13 (IL-13), which cause inflammation and impair skin barrier function. Recent treatments like JAK inhibitors (abrocitinib) and biologics (Dupilumab) targeting these cytokines effectively manage AD. However, the impact of long-term modulation on bone health, especially osteoporosis, is unclear. Osteoporosis, characterized by bone mass loss and increased fracture risk, has been linked to chronic inflammation, but the role of IL-4/IL-13 in bone metabolism requires further exploration.
Case Report - A 52-year-old woman with a 20-year history of AD experienced worsening symptoms despite using topical treatments. She was started on Dupilumab, leading to significant skin improvement. However, after six months, she reported new back pain, and a DEXA scan confirmed osteoporosis (T-score of -2.6). Her lab results showed normal calcium and vitamin D, but elevated bone turnover markers, with no other secondary causes for osteoporosis. The temporal link between Dupilumab use and bone loss raised concerns about IL-4/IL-13 inhibition affecting bone health [1-17].
Conclusions This case suggests a potential link between IL-4/IL-13 modulation in AD and osteoporosis development. Monitoring bone density in AD patients on long-term immunomodulatory therapy is crucial, especially in those at risk of osteoporosis, to prevent complications through early intervention and screening.

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P1065

DUPILUMAB THERAPY IN ATOPIC DERMATITIS AND THE ONSET OF OSTEOPOROSIS

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Background: Dupilumab, a monoclonal antibody that blocks interleukin-4 (IL-4) and interleukin-13 (IL-13), is approved for moderate-to-severe atopic dermatitis (AD), asthma, and chronic rhinosinusitis. It effectively reduces inflammation by inhibiting the IL-4 receptor, improving symptoms in AD patients. While generally safe, its long-term impact on bone health remains unclear. Osteoporosis, characterized by decreased bone density and increased fracture risk, may be influenced by inhibiting IL-4/IL-13, as they play protective roles in bone metabolism. This report discusses a rare case of osteoporosis in a patient undergoing Dupilumab therapy.

Case Report A 45-year-old male with severe AD, unresponsive to conventional therapies, was started on Dupilumab. Over a year, his symptoms improved significantly, with fewer flare-ups and enhanced skin healing. However, after 18 months, he developed musculoskeletal discomfort. A DEXA scan revealed osteoporosis (T-score of -2.8), with no history of steroid use, thyroid disorders, or other secondary causes. Normal vitamin D and calcium levels, alongside elevated bone resorption markers, pointed to a potential link between Dupilumab and bone metabolism disruption.

Conclusions This case suggests a possible connection between Dupilumab therapy and osteoporosis. While Dupilumab effectively controls AD by blocking IL-4/IL-13, it may impact bone health in long-term users. Regular bone density monitoring and early interventions, especially in at-risk patients, are recommended to mitigate potential bone loss. Further studies are needed to clarify the effects of IL-4/IL-13 inhibition on bone metabolism.

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P1066

ATOPIC DERMATITIS AND OSTEOPOROSIS: A CASE REPORT ON THE POTENTIAL LINK BETWEEN CHRONIC INFLAMMATION AND BONE HEALTH

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Background Atopic dermatitis (AD) is a chronic skin disorder driven by a Th2-dominated immune response with elevated cytokines like interleukin-4 (IL-4), interleukin-13 (IL-13), and IgE. Though AD is primarily seen as a skin disease, there is evidence suggesting that chronic inflammation associated with AD may affect bone health. Osteoporosis, characterized by reduced bone mineral density (BMD) and increased fracture risk, has been linked to inflammation that accelerates bone resorption.

Case Report A 38-year-old woman with a 25-year history of AD presented with worsening symptoms and increased corticosteroid use over the past year. Her AD primarily affected flexural areas, with flare-ups managed by corticosteroids and antihistamines. Over time, she also experienced joint pain, particularly in her back and hips. A DEXA scan revealed a T-score of -2.5, consistent with osteoporosis. Her calcium and vitamin D levels were normal, but elevated bone turnover markers indicated increased bone resorption. Prolonged corticosteroid use, reduced physical activity, and chronic AD-related inflammation were considered major contributors to her osteoporosis [1-17]

Conclusions This case highlights the possible link between chronic AD and osteoporosis, where systemic inflammation and corticosteroid use may disrupt bone remodeling. Clinicians should monitor bone health in AD patients, especially those with long disease histories or frequent corticosteroid use. Early screening and interventions, such as calcium and vitamin D supplementation and exercise, can help prevent osteoporosis and reduce fracture risks in these patients.

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EXPLORING THE LINK BETWEEN CHRONIC ATOPIC DERMATITIS AND OSTEOPOROSIS: A CROSS-SECTIONAL STUDY

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Background: Atopic dermatitis (AD) is a chronic skin disorder driven by a Th2-dominant immune response, leading to eczema and barrier dysfunction. Though primarily dermatological, AD's systemic inflammation may impact other organs, including bones. Osteoporosis, marked by reduced bone density and increased fracture risk, has been associated with chronic inflammatory diseases. This study explores the prevalence of osteoporosis in chronic AD patients and its contributing factors, including disease duration, severity, and corticosteroid use.

Materials and Methods: This 12-month cross-sectional study included 120 moderate-to-severe AD patients aged 30-65, compared with 120 healthy controls. Patients had a diagnosis of AD for over 5 years and a history of exacerbations requiring systemic treatment. AD severity was measured by the Eczema Area and Severity Index (EASI), and bone mineral density (BMD) was assessed using DEXA scans. Multivariate regression models analyzed the association between AD and bone health.

Results: Osteoporosis prevalence was higher in AD patients (25%) than controls (10%) ($p < 0.01$), and osteopenia was more frequent (40% vs. 22%). AD patients with longer disease duration (>10 years) and higher EASI scores had a greater likelihood of osteoporosis (OR: 2.8; 95% CI: 1.6-4.9). Systemic corticosteroid use in the past 2 years was also linked to increased bone loss ($p < 0.05$). Elevated C-reactive protein (CRP) levels in AD patients with osteoporosis supported the role of chronic inflammation in bone resorption. No significant differences were found in calcium and vitamin D levels between AD patients and controls[1-17]

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ATOPIC DERMATITIS AND OSTEOPOROSIS: A CASE REPORT OF CHRONIC INFLAMMATION LEADING TO BONE LOSS

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Background : Atopic dermatitis (AD) is a chronic skin condition characterized by eczema, pruritus, and barrier dysfunction. Emerging evidence suggests that AD's systemic inflammation may contribute to osteoporosis, marked by reduced bone mineral density (BMD) and increased fracture risk. Inflammatory cytokines like interleukin-4 (IL-4) and interleukin-13 (IL-13), which drive AD, may promote osteoclast activity and bone resorption.

This case report explores the potential link between long-standing AD and osteoporosis.

Case Report : A 40-year-old woman with a 15-year history of moderate-to-severe AD presented with worsening skin symptoms and new-onset back pain. Despite intermittent topical corticosteroid use, she experienced frequent exacerbations that required oral corticosteroids. Her physical activity had decreased due to discomfort from her skin and joint symptoms. Examination revealed widespread eczematous lesions, primarily in flexural areas.

A dual-energy X-ray absorptiometry (DEXA) scan showed a lumbar spine T-score of -2.6, consistent with osteoporosis. Lab results indicated normal serum calcium, vitamin D, and parathyroid hormone levels, but slightly elevated C-reactive protein (CRP), reflecting ongoing systemic inflammation.The patient's osteoporosis was likely due to a combination of chronic AD-related inflammation, corticosteroid use, and decreased physical activity. She was prescribed calcium and vitamin D supplements, advised to engage in weight-bearing exercises, and referred to an endocrinologist for further management. Her AD treatment plan was adjusted to reduce corticosteroid reliance and explore alternative therapies for better inflammation control [1-17]

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THYROID DISEASE AND OSTEOPOROSIS

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Objective: Hyperthyroidism can induce secondary osteoporosis. The mechanism of thyroxine osteoporosis involves the action of excess thyroid hormones on both osteoblasts and osteoclasts, stimulating their activity, but especially osteoclasts, resulting in the loss of bone mass. . Overt hyperthyroidism is defined as TSH and high triiodothyronine (T3) and/or free thyroxine (FT4), subclinical hyperthyroidism is defined as low TSH and normal T3 and FT4 concentrations. Untreated hyperthyroidism can cause cardiac arrhythmia, heart failure, osteoporosis, and adverse pregnancy outcomes. It can lead to weight loss, and is associated with increased mortality.

Methods: The study included 74 patients: 36 with thyroxine osteoporosis, age–39-61 years, 38 with postmenopausal osteoporosis in euthyroidism, age between 46-70 years. Clinical (anamnesis and objective examination) and paraclinical criteria were used to establish the etiological diagnosis. The research on bone metabolism was carried out by studying biochemical markers of bone turnover: markers of bone formation (osteocalcin, serum alkaline phosphatase), markers of bone resorption, terminal C telopeptides of type I procollagen (CrossLaps), and calciuria. Hormonological investigations revealed thyroxine osteoporosis: TSH, FT3, FT4, TRAb, LH, FSH, PRL, Estradiol, and progesterone. Postmenopausal osteoporosis cases: LH, FSH, Estradiol, progesterone, TSH, and FT4. Evaluation of bone mineral density by dual X-ray absorptiometry (DEXA) in patients with thyroxine osteoporosis induced by different clinical forms (Graves Basedow disease, autonomous thyroid nodule, multi-hetero-nodular-toxic goiter) of thyrotoxicosis, as well as in those with postmenopausal osteoporosis.

Results: Osteocalcin values for patients with thyroxine osteoporosis were 27.92 ± 19.47 ng/ml (an increase of approximately 60% compared to normal values premenopause). This shows a significant stimulation of bone formation by the excess thyroid hormones. For patients with postmenopausal osteoporosis the values were 17.29 ± 9.12ng/ml (close to the normal postmenopausal values 18.4±9.5ng/ml). Variations were correlated with the number of years since the onset of menopause. Postmenopause, following estrogen deficiency, bone remodeling increases in postmenopausal women to 0.506 ± 0.255ng/ml. The CrossLaps values determined in patients with thyroxine osteoporosis were between 0.304 ± 0.887 ng/ml (approximately 80% higher than the normal premenopausal values). For patients with postmenopausal osteoporosis, the values were 0.277 ± 0.842 ng/ml (close to the normal postmenopausal value of 0.251±0.761ng/ml)[1-17].

Conclusions: Analyzing the results obtained for subjects with thyroxine osteoporosis, it was observed that excess thyroid hormones induced an acceleration of both osteoformation and bone resorption, with a positive effect on bone resorption. Evaluation of the results of different therapeutic approaches: synthetic antithyroid drugs, radiotherapy, surgical treatment in combination with antiosteoporotic medication on bone mineral density.

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THYROTOXICOSIS AND OSTEOPOROSIS

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Thyrotoxicosis represents a complex of clinical manifestations induced by the presence of excess thyroid hormones at the tissue and receptor levels. This condition is considered a cause of endocrine osteoporosis. In thyrotoxicosis, both trabecular and cortical bone are affected, and the mechanism seems to be induced by increased resorption by accelerating local turnover

Objective: To identify cases of thyrotoxicosis and evaluate thyroid hormone status and bone mineral density.

Methods: 56 cases with thyrotoxicosis were included in the study: Graves-Basedow disease (22), toxic multi-nodular goiter (20), and toxic plummer adenoma (16), aged–22-64 years. In all cases, TSH, T4, FT4, T3, FT3, ATPO, and ATG levels were studied. Thyroid ultrasound was performed to highlight the dimensions of the gland, homogeneous/inhomogeneous appearance, presence of nodules, and type of vascularization. Exophthalmometry, EKG, EMG as well as bone mineral density by dual X-ray absorptiometry (DEXA) were also performed

Results: Osteodensitometry revealed osteoporosis in all cases with Graves-Basedow disease, toxic plummer adenoma, and in 5 of the cases with toxic multi-nodular goiter (83.9% of the cases studied).

Conclusions: Hormonological, immunological, and osteodensitometric evaluations are required in all cases of thyrotoxicosis. The institution of therapy with synthetic antithyroid drugs, beta-blockers, and immunosuppressants in combination with antiresorptive medication contributes to increasing bone mass and reducing fragility fractures. Thyrotoxicosis affects both trabecular and cortical bone, and the mechanism appears to be related to increased resorption by accelerating local turnover[1-17]

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P1071

BONE ENDOCRINE ORGAN

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Osteoporosis is a systemic, multifactorial, silent, and endemic skeletal disease characterized by decreased bone mass, damage to the microarchitecture of the bone tissue, increased bone fragility, and increased fracture risk. The bone is the beneficiary of the greatest informational and operational game, ensured first by the balance of the osteoforming hormonal mixture and then by other factors such as nutritional and mechanical factors. Recent research has revealed the multifaceted role of bone not only in structure but also as a complex endocrine organ that produces hormones responsible for the self-regulation of bone metabolism. Circulating osteocalcin increases insulin secretion, lowers blood glucose levels, and decreases visceral adipose tissue levels. Various cytokines, hormones, and growth factors can modu-

late osteocalcin production by modulating signaling pathways or by interacting with transcription factors acting on the promoter region of the osteocalcin gene (BGLAP gene on chromosome 1q25–q31). Osteocalcin has been reported to function as a hormone that regulates glucose metabolism, testosterone synthesis, muscle mass, brain development and function, and parasympathetic tone In men, it has also been shown to improve testosterone production by the testicles. Neuropeptide Y is produced by various cell types, including osteocytes and osteoblasts, and there is evidence to suggest that peripheral NPY is important for the regulation of bone formation. Hormonal disturbances are often associated with abnormal levels of bone turnover markers. These include commonly used bone formation markers (bone alkaline phosphatase, osteocalcin, and procollagen I N-propeptide) and resorption markers (serum collagen type I telopeptides, urinary collagen type I N-telopeptides, and tartrate-resistant acid phosphatase type 5b). However, bone is not exclusively composed of bone tissue. Bone marrow adipose tissue, an endocrine organ often compared to visceral adipose tissue, is found between trabeculae of the bone cortex. It secretes a diverse range of hormones, especially lipids, cytokines, and other factors, that exert various local and systemic effects[1-17].

Conclusions: The bone plays an important role in endocrine metabolism. Further research is needed to determine the exact relationship between bones, secreted hormones, and other endocrine organs. Determining their exact effects may be of great importance for the diagnosis and treatment of osteoporosis and obesity.

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BONES AND HORMONES

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Far from being an inert envelope surrounding the bone marrow, thus protecting hematopoiesis and the development of the immune system, bone is a complex organ that constantly changes under the control of hormones, cytokines, and the central and sympathetic nervous systems, and functions as an endocrine organ. As in other complex organs, bone function is controlled by a range of specialized cell types, which are on the bone surface or within the mineralized matrix. Research advances over the past decade have shed light on the various hormones that influence this process and modulate bone metabolism and structural integrity. More recently, novel and non-traditional functions of hypothalamic, pituitary, and adipose hormones and their effects on bone homeostasis have been proposed. This review highlights the recent work on physiological bone remodeling and discusses our current knowledge of the systemic interplay of factors that regulate this interplay. In this review, we provid a summary of literature on the relationship between bone physiology and hormones, including kisspeptin, neuropeptide Y, follicle-stimulating hormone (FSH), prolactin (PRL), adrenocorticotropic hormone (ACTH), and thyroid-stimulating hormone (TSH).), growth hormone (GH), leptin, and adiponectin levels. Discovering and understanding this new functionality will reveal a new layer of physiological circuitry [1-17].

Conclusions Thus, we hypothesize that there is a pituitary-bone and pituitary-fat axis that, when disrupted, causes diseases such as obesity and osteoporosis, which could potentially be used to target new therapies for these conditions

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THE INTERACTION BETWEEN NPY AND SEX HORMONES IN THE CONTROL OF BONE HOMEOSTASIS

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Sex hormones play a fundamental role in the maintenance of bone mass and etiology of osteoporosis. The expression of estrogen and androgen receptors on bone cells and the response of bone cells to sex steroid treatment in vitro highlights the importance of the direct action of these hormones on bone homeostasis. However, indirect evidence of action is much less appreciated, suggesting that estrogen signaling in the brain contributes to skeletal regulation. The NPY family of peptides and receptors influence numerous homeostatic processes and represent a complex and extensive regulatory apparatus. Its actions in bone to modulate osteoblast activity, and potentially osteoclastic activity, appear to be consistent and potent, with changes in both the central and peripheral aspects of this regulatory network [1-17].

Conclusion: Obviously, currently, interactions between the skeleton and energy homeostasis have was defined, thus providing a correlation between the body weight and bone mass. However, ongoing studies suggest additional interactions involving endocrine pathways, glucose homeostasis, and local actions in the bone, such as mechanical loading. Excitingly, the constant development of pharmacological agents and analytical tools points to continued analysis of NPY biology and new opportunities for biological and therapeutic understanding.

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THE LINK BETWEEN OSTEOPOROSIS AND SMOKING

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Objectives: Osteoporosis is the most common metabolic bone disease and is characterized by reduced bone mineral density (BMD). Osteoporosis can be defined as silent suffering due to a lack of symptoms and increase in the number of cases. Osteoporosis occurs mainly in elderly people, where the main complication is the occurrence of fractures, especially balance bills. This study aimed to evaluate bone mineral density in a group of both female and male patients to determine the incidence of osteoporosis caused by tobacco use [1-17].

Methods: A total of 140 patients (45 female and 95 male) aged 35–78 years were included in this study. Osteoporosis was diagnosed based on the assessment of bone mineral density (BMD) measured by X-ray absorptiometry X with double energy, osteocalcin, and beta cross-laps.

Results: From all the cases studied, approximately 60% of the patients (F 28% and M 32%) presented a T-score value between -2.5 SD and -5.5 SD, and 15% (F 7% and M 8%) presented a T score value between -1 SD and -2 SD; beta crosslaps with the values in the female sex <1ng/ml and in the male sex < 0.65ng/ml; osteocalcin in the female sex between 10-35 ng/ml, and for males between 11-40 ng/ml. The serum nicotine level in female smokers (123 + 25.6 µmol/L) was higher than that in male smokers (98 ± 33.8 µmol/L).

Conclusions: Osteoporosis is more common in females, but its incidence in males is observed to be slightly increasing. Smoking is a known risk factor for osteoporosis.

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P1075

IS THERE A HIGHER PREVALENCE OF OSTEOPOROSIS IN PATIENTS WITH BENIGN PAROXYSMAL POSITIONAL VERTIGO?

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Objectives: Benign paroxysmal positional vertigo (BPPV) is a prevalent vestibular disorder, particularly in older adults, and is characterized by episodes of vertigo. This study aims to investigate the potential association between BPPV and osteoporosis [1-11].

Material and Methods: The study included 15 patients diagnosed with BPPV, aged between 55 and 75 years. Comorbidities were analyzed: 10 patients were diagnosed with osteoporosis (66.6%), 4 (26.6%) with chronic urinary infections, and 6 (40%) with associated ENT pathology.

Results: Data from this study align with existing literature. Pooled analysis of the literature revealed a significantly higher risk of osteoporosis in the BPPV group compared to controls (odds ratio [OR], 1.73). The findings suggest that patients with BPPV have a higher prevalence of osteoporosis than those without.

Conclusions: The study highlights a potential link between BPPV and osteoporosis, suggesting the need for further research to understand the mechanisms underlying this association and its clinical implications.

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P1076

DEPOT-STEROID INJECTIONS FOR ALLERGIC RHINOSINUSITIS INCREASE THE RISK OF OSTEOPOROSIS?

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Objectives: This study aims to investigate whether depot-steroid treatment for allergic rhinosinusitis increases the risk of steroid-related diseases, including osteoporosis [1-11].

Material and Methods: The study included 124 patients diagnosed with allergic rhinosinusitis between 2018 and 2022. All participants received depot-steroid injections over varying time intervals: 37 patients (29.8%) for 5 years, 24 (19.3%) for 4 years, 21 (16.9%) for 3 years, 22 (17.7%) for 2 years, and 20 (16.3%) for 1 year. Steroid use was defined as receiving at least one injection between April and July. The study examined the relative risk of adverse outcomes such as osteoporosis, infections, diabetes, and tendon ruptures.

Results: No significant differences were observed in the incidence of infections or osteoporosis across the treatment groups.

Conclusions: Depot-steroid injections for allergic rhinosinusitis do not appear to significantly increase the risk of osteoporosis or infections. However, further studies with larger sample sizes are warranted to confirm these findings.

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P1077

INFLAMMATION AS A MEDIATOR OF THE ASSOCIATION BETWEEN OSTEOPOROSIS AND HEARING LOSS IN OLDER SUBJECTS: A POPULATION-BASED STUDY

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Objectives: With aging populations, the prevalence of hearing loss and osteoporosis is rising. Previous studies have suggested a link between these conditions, but the underlying pathophysiological pathway remains unclear. This study aimed to evaluate the potential association between hearing loss and osteoporosis in an older population and to assess whether this relationship varies with inflammatory status [1-11].
Material and Methods: We examined the association between osteoporosis and self-reported hearing loss in 110 subjects aged 75 and older, with no exclusion criteria. Bone density was measured using calcaneal quantitative ultrasound, and osteoporosis was defined as a T-score ≤ -2.5 standard deviations. Inflammatory status was assessed using high-sensitivity C-reactive protein (hs-CRP) levels.
Results: Hearing loss was found to be associated with osteoporosis (67%). This association was significantly influenced by hs-CRP levels ($p = 0.015$), indicating a role for inflammation. No significant variation was observed with sex ($p = 0.982$).
Conclusions: In elderly individuals, hearing loss is associated with osteoporosis, and this relationship appears to be mediated by higher levels of inflammation. These findings highlight the need for further research into inflammatory pathways as potential targets for intervention.
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P1078

RELATIONSHIP BETWEEN OSTEOPOROSIS AND OSTEOPENIA AND HEARING IMPAIRMENT IN POSTMENOPAUSAL WOMEN

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Objectives: Osteoporosis and osteopenia are progressive conditions marked by reduced bone density, particularly in postmenopausal women. This study aims to assess auditory function in postmenopausal women diagnosed with osteopenia or osteoporosis [1-11].
Material and Methods: The study involved 38 postmenopausal women aged 50–70 years with urological disease. Participants included 11 women newly diagnosed with osteoporosis, 15 with osteopenia, and 13 healthy controls. Audiological assessments comprised pure-tone audiometry (both conventional and extended high-frequency), speech audiometry, and impedance audiometry.
Results: Hearing thresholds were poorer across all frequencies in the osteoporosis group compared to both the osteopenia and control groups. Additionally, speech recognition and discrimination scores were significantly lower in the osteoporosis group.
Conclusions: Osteoporosis and osteopenia are significant risk factors for hearing and vestibular dysfunction in postmenopausal women. Regular monitoring of auditory and vestibular function through audiological assessments is recommended for these individuals.
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P1079

ASSOCIATION BETWEEN CHRONIC INFLAMMATORY SKIN DISEASES AND OSTEOPOROSIS: THE ROLE OF SYSTEMIC INFLAMMATION

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Objectives: Chronic inflammatory skin diseases, such as psoriasis and atopic dermatitis, have systemic inflammatory components that may contribute to the development of comorbid conditions, including osteoporosis. This study aimed to investigate the relationship between chronic inflammatory skin diseases and bone health, focusing on the potential mediating role of systemic inflammation [1-11].
Material and Methods: A total of 85 patients with chronic inflammatory skin diseases (45 with psoriasis and 40 with atopic dermatitis) and 40 age- and sex-matched controls were included in the study. Bone mineral density (BMD) was assessed using dual-energy X-ray absorptiometry (DEXA) at the lumbar spine and femoral neck. Systemic inflammation was evaluated by measuring serum levels of C-reactive protein (CRP) and interleukin-6 (IL-6). Patients with secondary causes of bone loss were excluded.
Results: Patients with chronic inflammatory skin diseases had significantly lower BMD at the lumbar spine (T-score: -2.3 ± 0.4) and femoral neck (T-score: -2.1 ± 0.3) compared to controls (T-score: -1.0 ± 0.3 and -0.9 ± 0.2, respectively, $p < 0.01$). Elevated CRP and IL-6 levels were observed in patients with skin diseases and were inversely correlated with BMD ($r = -0.45$, $p = 0.002$). Psoriasis patients with severe disease (Psoriasis Area Severity Index > 10) exhibited the highest prevalence of osteoporosis (35%), followed by those with atopic dermatitis (25%).
Conclusions: This study identifies a significant association between chronic inflammatory skin diseases and reduced bone density, highlighting systemic inflammation as a potential mediator. Dermatological patients with chronic inflammatory conditions should be screened for osteoporosis, and anti-inflammatory treatment strategies may reduce the risk of bone loss.

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P1080

VITAMIN D DEFICIENCY IN PATIENTS WITH CHRONIC SKIN DISEASES: A RISK FACTOR FOR OSTEOPOROSIS

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Objectives: Vitamin D deficiency, commonly observed in patients with chronic skin diseases such as vitiligo, eczema, and psoriasis, may contribute to the development of osteoporosis. This study aimed to evaluate the prevalence of vitamin D deficiency in dermatological patients and its potential impact on bone health [1-11].
Material and Methods: A cross-sectional study was conducted with 120 patients diagnosed with chronic skin diseases (40 with psoriasis, 40 with vitiligo, and 40 with eczema) and 50 healthy controls. Serum 25-hydroxyvitamin D [25(OH)D] levels were measured, and bone mineral density (BMD) was assessed using dual-energy X-ray absorptiometry (DEXA) at the lumbar spine and femoral neck. A 25(OH)D level <20 ng/mL was classified as de-

ficient.
Results: Vitamin D deficiency was significantly more prevalent in patients with chronic skin diseases (72%) compared to controls (36%, $p < 0.001$). Patients with vitamin D deficiency exhibited lower BMD at the lumbar spine (T-score: -2.2 ± 0.5) and femoral neck (T-score: -2.0 ± 0.4) compared to those with sufficient levels (T-score: -1.2 ± 0.3 and -1.0 ± 0.2, respectively, $p < 0.01$). Among dermatological conditions, patients with psoriasis showed the highest prevalence of osteoporosis (30%), followed by those with eczema (25%) and vitiligo (20%).
Conclusions: Vitamin D deficiency is highly prevalent in patients with chronic skin diseases and is associated with a greater risk of osteoporosis. Screening for vitamin D deficiency and bone health in dermatological patients is recommended, alongside supplementation strategies to reduce the risk of bone-related complications.

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P1081

TREATMENT OF IBANDRONIC ACID ASSOCIATED WITH K2 VITAMINE IN OSTEOPOROSIS FROM DELAYED PUBERTY

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Discovering frequently feminine cases with delayed puberty (hypogonadotrop or hypergonadotrop hypogonadism), is motivating the therapeutically broaching of hypogonadism osteoporosis that is installed more precocious compared with menopause [1-7].
OBJECTIVES: Gonadal insufficiency diagnosis and its etiology , the DMO evaluation, initiating differentiated therapeutically measures by rapport with the evolutive stage of bone mass deficit (osteoporosis /osteopenie) and with hypogonadism etiology .
MATERIAL AND METHODS:Were included in the study 22 cases with delayed feminine puberty with ages 16 to 23.At all cases DMO was evaluated by dual absorbtiometry with X rays (DEXA). The therapeutically options were aiming to non-pharmacological undertake:a diet with a positive level of Calcium and D vitamin, modifying the life style and easy physical exercises.Pharmacological therapy was applied at cases with osteoporosis which administrated antiresorptive agent-ibandronic acid in 150 mg doses at 30 days) in association with 45 mg K2 vitamine(MK7 or MENACHINONA-7)/day.
Results: Osteoporosis was confirmed at 9 cases.The efficiency of the treatment with ibandronic acid in association with K_2 vitamine,after 12 months of therapy, was superior then the separately bisfosfonates therapy.It was remarked an increase of DMO with 4,7 % at lumbar spine level and with 3,5% at femoral cervix level compared to 4.3% and 2.3% reported for ibandronic acid.
Conclusions: The study is confirming the efficiency association of ibandronic acid with K2 vitamine in delayed feminine puberty.
K_2 vitamine-latest discovery in terms of vitamins, is the most bio-available and bio-active form,which increases the efficiency of biofosfati treatment.
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P1082

STUDY OF BIOCHEMICAL MARKERS OF BONE TURNOVER AND BONE MINERAL DENSITY IN TURNER SYNDROME

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All formation errors of embryonic gonad were grouped under the name of gonadal dysgenesis. In the etiology of gonadal dysgenesis, the role of sexual chromosomes is well established because is conditioning the development of the gonad and implicit of enzymatic battery which is ensuring a biosynthesis of sexual hormones. Alteration of gonadogenesis process (the morphological dysgenesis) has multiples implications: perturbation of hormonal biosynthesis process, alteration of structure reactivity on gonadic hormones and , under clinical aspect, the perturbing of sexualisation process. The exclusion from the organism economy of sexual hormones is seriously influencing the bone structure, being the principal cause of osteoporosis [1-7].
OBJECTIVES : Identification of cases with Turner syndrome with feminine phenotype, hormonal evaluation on gonadotrope axis and the study of bone mineral density and biochemical markers of bone turnover.
MATERIAL AND METHODS: The study were performed on 15 cases with Turner syndrome with ages between 12-19 years.In the same time with karyotype study of ovarian(estradiol,progesterone) and gonadotropic hormones(LH,FSH) were evaluated the biochemical markers of bone turnover (serum Osteocalcin and Cross Laps) and bone mineral density were appreciated by dual absorbtiometry with X rays (DEXA).
RESULTS: It was highlighted osteoporosis on 8 cases, osteopenie at 4 cases(SCOR T=-2.5DS) , and for the remnants patients (3) biochemical markers and mineral bone density were in normal limits.
CONCLUSIONS: 1The study of biochemical markers of bone turnover and mineral bone density is mandatory for all cases with Turner syndrome cytogenetic confirmed.
The precocious diagnosis of osteoporosis/osteopenie , is claiming the estro-progestative hormonal substitution which represent the therapeutically attitude from the main intention.
Hormonal substitution associated with therapeutically means specific to bone remineralisation is preventing the apparition of fragility fractures.

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P1083

EVALUATION OF BIOCHEMICHAL MARKERS OF BONE TURNOVER IN PREMATURE OVARIAN INSUFFICIENCY

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In premature ovarian insufficiency or the syndrome of pauper ovaries, the follicular dower is much reduced and as a result is the deficiency of ovarian hormonopoiesis. As the number of follicles is lower the ovary`s life span is reduced, making the clinical spectrum to be characterized through the absence of puberty sexuality total or partial until the precocious installation of climacterium [1-7].
OBJECTIVES: The identification of ovarian failure secondary amenorrhea cases caused by premature ovarian insufficiency.Is demonstrated that the perturbation of hormonal secretion which controls the bone homeostasis, ratio bone formation-resorption is damaged and thus, bone mass decreases and causes osteoporosis.
MATERIAL AND METHODS: The study was performed on 78 patients whose ages ranged from 18-47 years.Hormonal investigations focused on the study of FSH, LH, PRL, estradiol, progesterone and also on the biochemical markers of bone turnover (osteocalcin and Cross Laps). Bone mineral density (BMD) was measured by absorbtiometry dual with X ray (DEXA).
RESULTS: Hormonal doses showed low levels of estradiol and progesterone, instead of gonadotropic that hormones were above the normal upper limit between 210-390 mUI/ml. There were also showed low levels for biochemical markers of bone turnover at half of the studied cases.BMD measurements revealed the presence of osteoporosis at 37cases - which represents 47.4% and 7 cases with osteopenie.BMD values correlate with biochemical markers of bone turnover.
CONCLUSIONS: 1.Evaluation of BMD and biochemical markers of bone turnover in premature ovarian failure must be done regularly after amenorrhea appearance, to identify patients who rapidly lose bone mass and are at increased risk of osteoporosis/osteopenia 2. Estrogen-progesterone substitution is the main and first treatment in premature ovarian failure to prevent osteoporosis/

osteopenia, metabolic and visceral complications. 3. Patients with osteoporosis will receive antiresorptive agents or proformative medication to prevent fragility fractures.

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P1084

THE STUDY OF DENTAL MODIFICATIONS IN CHRONICLE TETANY -RELATION WITH OSTEOPOROSIS

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OBJECTIVES: Chronic tetany is individualized as clinical form of tetany through intense trophic disorders occurring as a result of tetany subtle over time worsening , with or without symptoms of acute tetany. Chronic tetany presents subtle tetany symptoms that can occur amid bouts of muscle stiffness, but the trophic disorders of tetany subtle, barely sketched, become, by their multiplicity and intensity, the dominant clinical picture [1-7].

MATERIAL AND METHODS: The study was performed on 34 patients (18 men and 16 women) whose ages ranged from 19-42 years.Paraclinical investigations focused on the study: phospho-calcium metabolism (total blood calcium, calcium ion, urinary calcium, phosphorus blood, blood magnesium) electrophysiological investigations (EMG, EEK, EKG), evaluation of circulating PTH in selected cases, ultrasound and parathyroid CT,radiological exploration of long bones.

RESULTS: Through enamel and dentin alterations show up many signs of dystrophy dental, teeth are losing their luster and become mat or coated,sometimes dirty yellow,with gray or black ribbed. Their strength is diminished, abrasion surfaces eroding overmuch. Appear numerous cavities side .The side edges of the tooth erode,the tooth taking aspect of a nail or screw appearance. Finally the whole dental crown disappears .In some cases - 3-highlighted parathyroid hyperplasia.Imagistical explorer of long bones could highlight in 3 cases with parathyroid hyperplasia and fibrocystic bone lesions.

CONCLUSIONS: 1 Chronical tetany is the most common clinical form of primary hypoparathyroidism (surgical, drastically, infiltrative, idiopathic autoimmune-)

2. Treatment targets aimed eliminating the causes and correcting hypocalcemia

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P1085

STUDY OF BIOCHEMICAL MARKERS OF BONE TURNOVER AND BONE MINERAL DENSITY IN GONADAL DISGENESIAS

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All formation errors of embryonic gonad were grouped under the name of gonadal dysgenesis. In the etiology of gonadal dysgenesis, the role of sexual chromosomes is well established because is conditioning the development of the gonad and implicit of enzymatic battery which is ensuring a biosynthesis of sexual hormones. Alteration of gonadogenesis process (the morphological dysgenesis) has multiples implications: perturbation of hormonal biosynthesis process, alteration of structure reactivity on gonadic hormones and , under clinical aspect, the perturbing of sexualisation process. The exclusion from the organism economy of sexual hormones is seriously influencing the bone structure, being the principal cause of osteoporosis [1-7].

OBJECTIVES : Identification of cases with alteration of sexualisation process (gonadal dysgenesis), hormonal evaluation on gonadotrope axis and the study of bone mineral density and biochemical markers of bone turnover.

MATERIAL AND METHOD: The study were performed on 17cases with gonadal dysgenesis with ages between 12-32 year, from which: female genotype Turner syndrome (10 cases), Klinefelter syndrome (5 cases) and feminine testicle (2 cases-sisters).In the same time with karyotype study of gonadic and gonadotropic hormones were evaluated the biochemical markers of bone turnover (serum Osteocalcin and Cross Laps) and bone mineral density were appreciated by dual absorbtiometry with X rays (DEXA).

RESULTS: It was highlighted osteoporosis on 9 cases (52.94%), osteopenie at 4 cases , and for the remnants patients (4) biochemical markers and mineral bone density were in normal limits.

CONCLUSIONS: The study of biochemical markers of bone turnover and mineral bone density is mandatory for all cases with

gonadal dysgenesis.The precocious diagnosis of osteoporosis/ osteopenie , is claiming the hormonal substitution specifically to clinical form which represent the therapeutically attitude from the main intention. Hormonal substitution in association with therapeutically means specific to bone remineralisation is preventing the apparition of fragility fractures.

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P1086

THE STUDY OF OSTEOPOROSIS INCIDENCE IN THE SYNDROME OF PAUPER OVARIES

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At patients with premature ovarian insufficiency or the syndrome of pauper ovaries, the follicular dower is much reduced and as a result is the deficiency of ovarian hormonopoiesis. As the number of follicles is lower the ovary`s life span is reduced, making the clinical spectrum to be characterized through the absence of puberty sexuality total or partial until the precocious installation of climacterium [1-7].

OBJECTIVES: The identification of ovarian failure secondary amenorrhea cases caused by premature ovarian insufficiency. During the perturbation of hormonal secretion which controls the bone homeostasis, ratio bone formation-resorption is damaged and thus, bone mass decreases and causes osteoporosis.

MATERIAL AND METHODS: The study was performed on 64 patients whose ages ranged from 19-43 years.Hormonal investigations focused on the study of FSH, LH, PRL, estradiol, progesterone.The patients underwent utero-ovarian pelvic sonography. Bone mineral density (BMD) was measured by absorbtiometry dual with X ray (BMD) at the spine, pelvis and radius. The biochemical markers of bone turnover studied were serum osteocalcin and Cross Laps by ELISA.

RESULTS: Hormonal doses showed low levels of estradiol and progesterone, instead of gonadotropic that hormones were above the normal upper limit between 210-390 mUI/ml. BMD measurements revealed the presence of osteoporosis at 29 cases - which represents 45.31% of all cases investigated.BMD values correlate with biochemical markers of bone turnover.

CONCLUSIONS: .Evaluation of BMD and biochemical markers of bone turnover in premature ovarian failure must be done regularly to identify patients who rapidly lose bone mass and are at increased risk of osteoporosis.Estrogen-progesterone substitution is the main and first treatment in premature ovarian failure to prevent osteoporosis/osteopenia, metabolic and visceral complications. Patients with osteoporosis will receive antiresorptive agents or proformative medication to prevent fragility fractures.

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P1087

TREATMENT OF IBANDRONIC ACID ASSOCIATED WITH MENAQUINONE-7 IN HYPOGONADIC OSTEOPOROSIS

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Discovering frequently cases with hypogonadism (feminine or masculine), is motivating the therapeutically broaching of hypogonadism osteoporosis that is installed more precocious in comparing with the menopause-one[1-7].

Objectives: Gonadal insufficiency diagnosis and its etiology , the DMO evaluation, adopting differentiated therapeutically measures in rapport with the evolutive stage of bone mass deficit (osteoporosis /osteopenie) and with hypogonadism etiology .

MATERIAL AND METHODS: In the study we included 67 cases with hypogonadotroph and hypergonadotroph hypogonadism with ages 12 to 37.At all cases DMO was evaluated by dual absorbtiometry with X rays (DEXA).The therapeutically options were aiming to: non-pharmacological undertake (a diet with a positive level of Calcium and D vitamin, modifying the life style and easy physical exercises).Pharmacological therapy was applied in all cases with osteoporosis that received antiresorptive agent-ibandronic acid in 150 mg doses at 30 days) in association with 45 mg vitamine K2 (MK7 or MENACHINONA-7)/day.

Results: Osteoporosis was confirmed at 39 cases.The efficiency of the treatment with ibandronic acid in association with K_2 vitamine,after 12 months of therapy, was superior then the separately bisfosfonates therapy.It was observed an increase of DMO with

4,4 % at lumbar spine level and with 2,6% at femoral cervix level compared to 4.2% and 2.1% reported for ibandronic acid.

Conclusions: The study is confirming the efficiency of association between ibandronic acid and menachinona 7 in hypogonadism osteoporosis.

MK7(K_2 vitamine)-latest discovery in terms of vitamins, is the most bio-available and bio-active form,which increases the efficiency of biophosphonates therapy.

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P1088

THE INFLUENCE OF HYPERSECRETION OF STH IN THE GROWTH AND DEVELOPMENT OF THE DENTO-MAXILLARY APPARATUS

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Secretory disorders of the endocrine glands have a significant impact on the development and functioning of the dentomaxillary apparatus because of the complex interactions between the endocrine system and the processes of craniofacial growth. The articles in the specialized literature reveal, in recent years, an increase in the prevalence of dentomaxillary anomalies class III Angle and implicitly those of class III/1 Angle (true mandibular pronation). Hypersecretion of STH causes juvenile acromegaly with repercussions for the growth and development of the dentomaxillary apparatus. Hypersecretion of the pituitary somatotropic hormone (STH) influences both endochondral and desmal growth. Thus, in the age period of 6-16 years, the hypersecretion of STH generates an exaggerated growth of the skeleton with the appearance of mandibular pronation associated with macroglossia, one as the most serious orthodontic condition. Early intervention and treatment that control STH levels are essential to limit these effects. In severe cases, a multidisciplinary approach (endocrinology, orthodontics, and maxillofacial surgery) is crucial.[1-10]

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P1089

THE INFLUENCE OF STH HYPOSECRETION IN THE GROWTH AND DEVELOPMENT OF THE DENTO-MAXILLARY APPARATUS

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The pituitary gland ensures hormonal balance in the body and influences metabolism and reproduction as well as the growth and development of the entire body. Hyposecretion of STH can negatively influence the development and functioning of the dentomaxillary apparatus. Thus, the hyposecretion of STH until the age of 6 years, at the level of the dentomaxillary apparatus, causes an insufficient development of the jaws with the appearance of dental inclusions and dentoalveolar incongruities with dental crowding. Between 6 and 16 years of age, the hyposecretion of STH causes, at the level of the dentomaxillary apparatus, the appearance of mandibular retrognathion, and insufficiently developed alveolar arches with the appearance of inclusions and dental malpositions. After the age of 16 years, hyposecretion of STH leads to demineralization in the alveolar arches associated with tooth loss.

Thus, orthodontic treatment for the correction of malocclusions must be associated with monitoring of STH secretion by endocrinologists. Interdisciplinary collaboration between endocrinologists, orthodontists, dentists, and psychologists is essential, offering the patient the best solutions for the general state of health and implicitly for the dentomaxillary apparatus[1-10]

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ASPECTS OF EXPLOSIVE CARIES IN PATIENTS WITH OSTEOPOROSIS

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For the study, 36 patients diagnosed with osteoporosis were selected. Patients were examined and based on well-established clinical signs, both incipient carious lesions and explosive carious lesions were highlighted. Moreover, the study also allowed an association with diet, smoking, but also with a series of gastro-duodenal or endocrine diseases. Patients had varied treatment for osteoporosis, which influenced the presence and evolution of existing caries.

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P1091

THE INFLUENCE OF SYSTEMIC DISEASES IN THE EVOLUTION OF ODONTO-PERIODONTAL DISEASES

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Examining the mouth cavity can reveal signs of underlying systemic disease and provide information about general health. Autoimmune, hematologic, endocrine, and neoplastic processes are among the systemic disorders that manifest orally. Changes in the salivary and parotid glands, tongue abnormalities, and mouth ulcers are all signs of autoimmune illness. Depending on the etiology, patients with hematologic diseases may present with glossitis or gingival bleeding. Depending on the underlying condition, oral alterations linked to endocrine disorder can vary. Metastatic lesions affecting the mouth cavity's soft and bone structures are examples of neoplastic alterations. Dental erosions that result in halitosis or mouth pain can be seen in patients with long-term conditions such eating disorders and gastroesophageal reflux. Dentists' comprehensive history-taking and physical examinations can help identify the underlying cause of oral alterations and enable doctors to intervene earlier[1-10].

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P1092

THE ROLE OF VITAMINS AND FLUORIDES IN THE FORMATION AND EVOLUTION OF JAW BONES

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For healthy dentition and oral tissues to grow, develop, maintain, and repair, the right nutrients must be available. Deficits in calcium, fluoride, protein, vitamins A, C, and D, folate, and other B complex vitamins are especially pertinent to dental practice. Scurvy, cleft palate, enamel hypoplasia, poor mineralization, caries, and other pathoses are all caused or exacerbated by a deficiency of these nutrients, which impact almost every structure in the oral cavity. Individuals with bad behaviors can also exhibit damage to their teeth; for instance, a diet high in sugars will encourage caries and demineralization. A bad diet can also lead to diabetes, which is linked to oral candidiasis and periodontitis.
The dentist can ask patients about their eating habits and offer advice to promote a healthy lifestyle if they are aware of these linkages [1-10].

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NUTRITIONAL ASPECTS IN ROMANIAN ADOLESCENTS

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The transition to processed foods in Romanian diets has led to a rise in vitamin and mineral deficiencies in teenagers, which can affect growth and health and frequently show up as oral sores. In order to provide guidance and avoid long-term problems, this review study sought to investigate the relationship between nutritional inadequacies and teenage dental health. Because oral health and nutritional inadequacies are linked, integrated healthcare is necessary. Holistic approaches and early treatments can enhance results and lessen long-term consequences. Regular dental exams and thorough health education are crucial for both prevention and treatment, improving health in all populations [1-10].

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P1094

VASCULAR CHANGES AT THE DENTAL PULP LEVEL IN DIABETES

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Diabetes mellitus significantly raises the risk of myocardial infarction, stroke, and amputation—the conditions that cause the majority of morbidity and death. In the development or progression of diabetic macroangiopathy, raised high shear blood vis-

cosity with decreased erythrocyte deformability and elevated low shear blood viscosity with erythrocyte aggregation may be significant and perhaps treatable variables. Diabetes-related metabolic problems lead to vascular dysfunction and blood rheological alterations, which make this patient population more susceptible to atherosclerosis. Atherosclerosis is caused by vortices with oscillating shear stress and decreased shear stress. The development of atherosclerosis and the effects of plaque erosion or rupture in diabetes may be made worse by abnormalities in platelet function and elevated blood coagulability[1-10].

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P1095

LONG-LASTING SYSTEMIC GLUCOCORTICOIDS THERAPY AND CHRONIC APICAL PERIODONTITIS

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Relying on higher life expectancy, especially in aged peoples is increasing the number of dental patients affected by systemic medical conditions. As the global prevalence of chronic apical periodontitis in humans is higher in subjects with systemic conditions (63% vs 52%) that explain why corticosteroids medication may rise the issue of their side effects in evolution of chronic apical lesions [1].

Glucocorticoids are steroid hormones used as analogues of endogenous cortisol commonly used as anti-inflammatory drugs. There are involved in the synthesis of macromolecules. Though the effect of glucocorticoids comes out between a couple of hours or days it should be stressed that their clinical efficiency was still proved after the descending of their plasma level.

The side effects of glucocorticoids, directly related of dose and treatment duration, rely on the inhibitory effect on the immune system, inflammatory response and induction of bone resorption. [2,3]

Acting as modifiers of genuine biological response of host, glucocorticoids endorse infection, osteopenia and osteoporosis. At the tissues level the chronic main adverse effect of glucocorticoids results in embarrassment of fibroblast proliferation and successive type I collagen synthesis and deposition, inhibition of blood capillaries formation, lowering the osteoblasts function in parallel with enhancing the osteoclasts number and activity.

These chronic deleterious outcomes of long lasting glucocorticoids treatment suggest worsen changes in evolution and treatment prognosis of already installed chronic apical periodontitis as the pulp necrosis and bone loss are accelerated. [4]

Accordingly, the use of an apical lesion model in Wistar rats proved that prednisone accelerated the dental pulp necrosis. Furthermore, prednisone treatment increased the rate of chronic apical lesion formation by accelerating the chronic inflammatory cell invasion dependent on pro-inflammatory cytokines. Both collagen type I and type III were also reduced by prednisone. In contrast, significantly increased the number of TNF-α and TRAP immunopositive cells in the apical area of the induced animal lesion model.

On the other hand unlike the typical oral microorganisms in the presence of periodontal pathogens the corticosteroid therapy proved to be an aggravating factor of chronic apical lesion[5,6]. Experimental orthodontic movement under long-lasting corticoid therapy in rats showed extended orthodontic movement surface and associated bone erosion

Stimulating the osteoblast and osteocyte apoptosis and subsequent bone loss glucocorticoids are also in charge with increasing the osteoclasts survival and activity. Moreover, by increasing the expression of RANKL (receptor activator of nuclear factor K ligand) glucocorticoids are also stimulating the pre-osteoclasts, driving to reducing number of bone matrix-forming cells and enhancing the ability of chronic apical lesion in local bone resorption [7-10].

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CHRONIC APICAL PERIODONTITIS IN DIABETIC TYPE 2 PATIENTS

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Commonly the apical bone resorption associated to chronic apical periodontitis is the synergistic outcome of the inflammatory elicited bacterial LPS (lipopolysaccharide) and immune response of the host. Actually the bone loss is initiated following the RANKL (receptor activator of nuclear factor K ligand) expression in osteoblasts which bind to RANK (receptor activator of nuclear factor K) of osteoclasts. The bone resorption is modulated by OPG (osteoprotegerin) receptors competitor with RANK.[1]
However, for triggering the bone matrix resorption is mandatory the involvement of MMPs (metalloproteinases), such as MMP-9, in order to facilitate the osteoclasts adhesion to bone interface. Furthermore, other molecular signals sent to PTH (parathyroid gland hormone) and PTHrP (parathyroid hormone-related protein) activate the RANKL/RANK coupling to initiating the aimed bone resorption.
However in a study of chronic apical periodontitis in diabetic type 2 patients compared with normoglycaemic ones there were not found significant differences by analyzing the immunoexpression of biomarkers RANK, PTHrP and MMP-9 involved in the bone loss process. In addition it seems that the effective glycaemic control in diabetic patients was crucial in preventing an enhanced apical bone resorption.
Diabetic patients have a higher incidence of dental caries and chronic apical periodontitis than non-diabetics of similar ages. High glycohemoglobin HbA1c levels drive to increased incidence of chronic apical periodontitis asking endodontic treatment. [2,3]
The impaired PMN (polymorphonuclear leukocytes) in uncontrolled blood glucose level facilitates the extension of pulp inflammation. The symptomatic irreversible pulpitis seems to be significantly higher in diabetic patients younger than 40 years than in non-diabetic patients.
Whether some other endocrine diseases such as hyperparathyroidism may modify the response to pulp sensibility tests it was supposed that some similar clinical outcomes may also present the diabetic patients due to the different biochemical factors running in diabetic pulp tissue[4].
Actually no significant differences were related between diabetic and non-diabetic patients in responses to electric and cold pulp tests. However, it was observed that aging provoked a significant reduced response to cold tests in diabetics' maxillary premolars. It seems that the obliterating endarteritis and the limited collateral blood circulation in elderly as well as the degrading antioxidant systems are cooperating in that respect[5].
Irreversible pulpitis and chronic apical periodontitis either primary or post-treatment persistent commonly require root canal treatment. [6]. Though chronic apical periodontitis are strongly associated with type 2 diabetes there are still controversies regarding the occurrence of post-treatment apical lesions in diabetic patients.
A recent meta-analysis revealed a higher prevalence of post-treatment chronic apical periodontitis in type 2 diabetes patients especially in cases of previous apical lesions. Moreover, the pathologic condition leads to poorer resolution of apical located chronic lesion[7-10].

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MELATONIN IS IMPROVING CHRONIC APICAL PERIODONTITIS RESOLUTION

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Apical osteolytic lesion that characterizes the chronic apical periodontitis is an immune response to root canal infection relying on disturbed redox balance which triggers the local tissue damage. Reactive oxidative species (ROS) confined to the apical lesion progressively diffuse into blood stream negatively affecting systemic health.[1]
Melatonin is a hormone synthesized mostly in the pineal gland that improves the insulin sensitivity and exhibits anti-inflammatory effects. Regarding the chronic apical periodontitis, it was reported that melatonin reduces both the inflammation and local apical bone loss [2].
The large protective capacity of melatonin against free radicals is mirrored in increasing the activity of some antioxidant enzymes such as glutathione reductase, superoxide dismutase and glutathione peroxidase.
On the other hand, melatonin ameliorates insulin resistance by restoring the pathway of Akt phosphorylation. Accordingly it may

be hypothesized that melatonin should reverse some systemic disturbances related to plasma concentration of glucose and pro-inflammatory cytokines as well as insulin resistance.[3]
The well known pro-inflammatory cytokine TNF-α is upregulated in exudates harvested from root canals of teeth with chronic apical periodontitis and even in irreversible pulpitis that finally result in pulp necrosis.
However it was proved that fortunately melatonin ameliorates periodontal conditions by reducing the depth of periodontal pockets as well as the plasma concentration of TNF-α and IL-1β in both gingivitis and acute pulpitis.
Is noteworthy that chronic apical periodontitis supports insulin resistance, higher levels of pro-inflammatory cytokines such as TNF-α, IL-1β and IL-6 along with decrease of IL-10 and prejudices the transduction of insulin tissue signaling.
Accordingly melatonin is considered a potent antidiabetic agent as influences the insulin secretion and can be therapeutically used for the prevention of insulin resistance. [4]
The positive findings of melatonin improving effects in rat experimental model on insulin resistance induced by chronic apical periodontitis, plasma concentration of cytokines TNF-α, IL-1β and IL-10 suggests a translational survey to humans to mitigate the side effects of chronic apical periodontitis [5].
On the other hand, looking to the future, melatonin might be a promising adjuvant in regenerative endodontics due to its proved effects on biological and immunomodulatory properties of dental pulp stem cells [6-10].

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P1098

HISTOLOGICAL STRUCTURE OF THE SHAFT OF TIBIA IN DIABETIC RATS AFTER REPEATED FRACTURE OF THE TIBIA

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Objective. Objective of the study is to investigate histological structure of the shaft of tibia in diabetic rats after repeated fracture of the tibia
Material and Methods. Female rats (n=72, m=155 g) were distributed into three groups. Group 1 comprised intact animals. Group 2 comprised non-diabetic animals with 2-mm openings in metadiaphyseal areas of the femur and the tibia as a model of fracture. Tibia surgery was performed after complete healing of femur fracture. Group 3 comprised animals with diabetes caused by adipogenic diet and surgeries identical to those of group 2. Observation terms were 7, 15, 30, and 60 days. On expiration of each term tibiae were collected and undamaged areas of tibiae shafts were prepared for histological study. Morphometry of HE stained cross-sections of the shafts included measurements of outer circumferential lamellae (OCL), osteonic layer (OL), and inner circumferential lamellae (ICL)
Results. In animals of the group 2 as compared to the group 1 OCL exhibited compensatory widening in all observation terms – by 5.12%, 5.04%, 4.61%, and 5.72% respectively. ICL also increased by the 7th, the 15th, and the 30th day – by 6.62%, 5.36%, and 6.59%. OL on the contrary narrowed in the period from the 7th to the 30th day by 5.20%, 7.83%, and 8.91% respectively. In the group 3, in comparison with the group 2 OCL narrowed in all observation terms by 7.61%, 7.46%, 6.32%, and 6.53%. ICL also exhibited narrowing in the same period – by 7.82%, 4.68%, 6.21% and 6.53%. OL narrowed as well – by 4.02%, 4.09%, 7.46, and 9.15%. Unlike those of group 2, these values testify for absence of recovery.
Conclusions. In non-diabetic animals repeated fracture resulted in deranged cortical bone remodeling accompanied by compensatory hypertrophy. In diabetes, all layers of the cortical bone exhibited narrowing throughout of the whole study, which testifies for severe derangement of bone remodeling without signs of restoration.

P1099

AGE-RELATED FEATURES OF THE HISTOLOGICAL STRUCTURE OF THE LOWER INCISOR IN WHITE RATS UNDER CONDITIONS OF CHRONIC RENAL FAILURE

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Objective: Chronic renal failure (CRF) is often the cause of osteodystrophy. Morphological state of the dental system in conditions of CRF has been studied fragmentarily. Morphogenesis of the lower incisor (LI) under these conditions hasn't been studied at all.
Material and Methods: 216 male rats of three age groups: infantile, mature and senile, which were divided into two groups. Group 1 – intact animals. Group 2 – rats with CRF. At the end of the experiment, the LI were isolated and histological sections were prepared.
Results: In the 2nd group from the 7th to the 90th day of the experiment, the width of the odontoblast layer was less than the values in the 1st group by 5.63%, 6.65%, 6.65% and 7.44%, the width of the predentin layer - by 4.47%, 5.17%, 6.61%, and 7.89%, the width of the dentin layer - by 4.57%, 6.07%, 8.74% and 9.04%, and the mesiodistal size of the LI - by 3.47%, 4.06%, 4.51%, and 5.46%. In

mature rats morphofunctional activity of the odontoblasts of the LI also decreased but from the 15th day. In juvenile rats, the width of the odontoblast layer from day 15 to day 90 was less than the values in 1st group by 4.29%, 5.64%, and 6.88%, and the width of the predentin layer, the width of the dentin layer and the mesiodistal size of the LI by days 30 and 90 were less by 4.45%, and 5.41%, by 3.66% and 6.95%, and by 4.43%, and 4.97%. In senile rats with CRF, the width of the predentin and dentin layers from the 7th to the 90th day lagged behind the values of 1st group by 5.00%, 5.60%, 6.34%, and 7.79% and by 4.36%, 6.74%, 6.41%, and 8.07%, the width of the odontoblast layer from the 15th to the 90th day - by 4.26%, 5.08%, and 6.54%, and the mesiodistal size of the LI by the 50th and 90th days - by 2.97% and 3.25%.
Conclusion: Experimental CRF in rats of different age groups is accompanied by suppression of dentinogenesis in the LI. These changes are observed earlier in infantile animals and senile rats and later in mature rats.

P1100

THE EFFECTS OF LOCAL AND SYSTEMIC CALCIUM SOURCES ON CHEMICAL CONTENT OF BONE REGENERATE IN DIABETIC RATS AFTER REPEATED FRACTURE

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Objective: The study is aimed at analysis of chemical content of bone regenerate formed after administration of local and systemic calcium sources in diabetic rats with repeated fracture.
Material and Methods: The experiment involved 96 female rats (m=155 g). Animals were distributed into four groups. Group 1 - intact animals. Group 2 - rats with diabetes and 2-mm openings in metadiaphyseal areas of the femur and the tibia as a model of repeated fracture. Group 3 - diabetic animals with repeated fractures and OK-015 implants. Group 4 - rats identical to those of group 3 treated with Calcemine Advance. Observation terms were 7, 15, 30, and 60 days. The content of the mineral component, organic substances and water was determined by the percentage-spring method.
Results. In group 2 compared with group 1, an imbalance of the main fractions of bone tissue was observed. In group 3 compared with group 2, water share decreased by 7 by 11.12% followed by an increase on 30 and 60 days by 17.09% and 15.59%. The organic matter share decreased from the 7th to the 60th day by 12.44%, 23.01%, 13.40% and 4.63%, which may indicate a temporary restoration of the chemical composition. The minerals share increased on the days 7 and 15 by 18.13% and 23.57%, and decreased later on the days 30 and 60 by 5.31% and 9.21%. In group 4, compared with group 3, a share of water decreased on the days 30 and 60 by 11.67% and 9.82%. The share of organic matter increased only on the 7th day by 4.83%, and minerals share decreased on the 15th day by 3.58% and increased on the days 30 and 60 by 10.45% and 8.69% respectively.
Conclusions. In case of repeated fracture in Type 2 diabetes, instability of the chemical composition of the regenerate is observed. Implantation of OK-015 results in temporary restoration of the balance of main bone fractions. Combined Calcemin Advance and OK-015 action leads to restoration of the chemical composition in later terms, which is the most optimal result.

P1101

MEASURING BONE DENSITY BY CALCANEAL QUANTITATIVE ULTRASOUND BASED-STRATEGY (QUS)

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Objectives
When assessing the risk of osteoporotic fractures, quantitative ultrasonography (QUS) is an alternative to dual-energy x-ray absorptiometry (DXA scan) for bone mineral density (BMD) measurement. QUS is not recommended for decision-making regarding the start of treatment or follow- up of osteoporosis. Bone density can be studied non-invasively using QUS. The benefits of this technique are affordable and portable instruments, the patient is not exposed to radiation, and it is safe. The study evaluated the spectrum of age and gender structure, clinical entity (healthy population, osteopenia, osteoporosis), body mass index (BMI), and comorbidity.
Methods and Materials
The study is prospective, descriptive and analytic. The study evaluated the spectrum of age and gender structure, clinical entity (healthy population, osteopenia, osteoporosis), body mass index (BMI) and comorbidity. Analyses were conducted in "MHS" Private Practice for Physical Therapy and Rehabilitation. We included the total of 80 patients, 75 female and 5 male, who answered the Osteoporosis Risk Assessment Questionnaire and underwent calcaneal quantitative ultrasonography. The Osteoporosis Risk Assessment Questionnaire includes 19 questions. Comparison was made between our results and the results from PubMed database for published research studies and review papers in English language.
Results
The study included 80 patients, 5 male and 75 female patients. The entities important for osteoporosis assessment and diagnosis are gender, menopause if female, prolonged corticosteroid use, cigarette consumption and T score. The majority of patients who are exposed to corticosteroid use, cigarette consumption and early menopause have a great risk of developing osteoporosis and thus have lower values of T score.
Discussion and Conclusions
The correlation of osteoporosis and osteopenia with all the factors that were analyzed in the study (gender, age, early menopause, corticosteroid use, cigarette, and alcohol consumption, and decrease in height) plays an important role in diagnosis and

treatment. Results from this study suggest that QUS can be used to assess osteoporosis risk and should be a part of routine gynecologic, physical, and family medicine examinations.
Keywords: osteoporosis, osteopenia, screening, ultrasonography, bone density

P1102

PREVALENCE OF VITAMIN D DEFICIENCY AND PERCENTILE VALUES FOR SERUM VITAMIN D CONCENTRATIONS IN IRANIAN CHILDREN AND ADOLESCENTS: A POPULATION-BASED STUDY

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Objectives: Reference values for determining vitamin D deficiency can vary based on ethnicity, age, and region of residence. This study aimed to assess the prevalence of vitamin D deficiency and establish reference intervals for serum vitamin D levels among Iranian children and adolescents.
Materials and Methods: This nationwide cross-sectional study involved 2596 students aged 7 to 18 years. A parametric method was employed to define age-specific reference values by generating smooth centile curves and explicit formulas for centile estimates and standard deviation scores, stratified by sex and region of residence.
Results: Serum 25-hydroxyvitamin D deficiency (<30 ng/mL) was observed in approximately 70% of participants. The percentage of girls and boys with vitamin D levels (VDL) between 10 and 30 ng/mL was 58.5% and 62%, respectively, while VDL fell below 10 ng/mL in 11.3% of girls and 9.9% of boys. Significant differences in VDL were noted between rural and urban residents ($P < 0.05$). Children aged 7 to 12 years had higher serum VDL than adolescents aged 13 to 18 years (26.96 ± 8 ng/mL vs. 26.04 ± 10 ng/mL, $P = 0.007$). The estimated reference intervals for circulating 25(OH)D levels, corresponding to the 5th and 95th percentiles, were 11.45 to 48.40 ng/mL for boys and 9.51 to 47.69 ng/mL for girls. Significant variations in VDL were also observed across different age groups ($p<0.05$).
Conclusion: This study established reference intervals for serum vitamin D levels across various age groups, taking into account sex and region. Additionally, we found that vitamin D deficiency affects approximately 70% of Iranian adolescents and children. Therefore, implementing appropriate interventions to maintain bone health and prevent future osteoporosis should be prioritized.
Keywords: Vitamin D, Children, Adolescent, Bone Health, Prevention

P1103

DEVELOPMENT OF A NOVEL DIETARY QUESTIONNAIRE TO EVALUATE KEY NUTRIENTS ESSENTIAL FOR BONE AND MUSCLE HEALTH

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Objectives: Due to the importance of dietary assessment in the prevention and management of osteoporosis and sarcopenia, and considering the time-consuming nature of food frequency questionnaires (FFQs), the development of a shorter questionnaire with acceptable validity and reliability is prioritized. Accordingly, we aimed to develop a shorter dietary questionnaire and examine its validity and reliability in the elderly.
Methods & Materials: This pilot study involved 100 individuals over the age of 50 who participated in a multi-center osteoporosis study (IMOS). Participants completed a 168-item Food Frequency Questionnaire (FFQ) through face-to-face interviews, and after a two-week interval, a novel questionnaire was filled out. A 24-hour urine sample was also collected to measure calcium levels. The correlations of nutrients essential for bone and muscle health in two questionaries were examined to assess validity, and reliability was evaluated based on expert feedback.
Results: Correlations between two questionnaires on energy intake, carbohydrate, protein, fat based on intraclass correlation (ICC) were 0.65, 0.59, 0.68, respectively ($P<0.001$ for all). ICCs for key nutrients including calcium, phosphorus, and magnesium were 0.78, 0.75, 0.54, respectively ($P<0.001$ for all). The correlations between vitamin D intake and serum levels of vitamin D for both questionnaires were weak ($P=0.5$ for both). Cronbach's alpha was also more than 0.70.
Conclusion: The novel short-form dietary questionnaire demonstrates acceptable validity and reliability in assessing total energy, macronutrients, and nutrients essential for bone and muscle health in the elderly. However, since the primary source of vitamin D is sunlight, using dietary questionnaires to estimate vitamin D levels is not practical; therefore, serum vitamin D measurement is recommended.
Keywords: Osteoporosis, Diet, Nutrients, Dietary Assessment

P1104

TOTAL PROTEIN INTAKE AND PROTEIN SOURCES IN A POPULATION AT RISK OF OSTEOPOROSIS

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Objectives: Protein intake can have a detrimental impact on the prevention of osteoporosis and sarcopenia, depending on various factors, including the sources of protein. Therefore, in this population-based study, we aimed to clarify the total intake of protein and the prominent source at both national and subnational levels in Iran.

Methods and Materials: In this population-based survey, Iran was divided into five strata based on osteoporosis risk factors, and one to two provinces were selected from each stratum. The participants (n=1,272) were individuals over 50 years of age who were at risk of osteoporosis. To assess dietary intake, a 168-item Food Frequency Questionnaire was utilized.

Results: Based on protein intake, the study population was categorized into 3 groups (<0.8, 0.8-1.2, >1.2 g/kg/day). The majority of participants (≈46%) fell in the middle (0.8-1.2g/kg/day) category. This pattern was also consistent across sex and age groups, place of residence, educational and socioeconomic status. Compared to men, women consumed more protein (median: 0.95 vs 1.05 g/kg/day, $p < 0.001$). The dietary animal-to-plant protein ratio was 0.9 (interquartile range of 0.65, 1.24). The top four food sources for providing total protein were dairy, refined grain, whole grain, and red meat (53% of total protein intake). The prominent protein source was plant protein (52%) and refined grains contributed around 28% of this protein source (14% of total protein intake) in both men and women.

Conclusion: The current population-based study revealed that the prevalence of insufficient protein intake (<0.8 g/kg/day) was 32.5% in elderly Iranian women and 18.2% in men. Approximately 13% of total energy intake was derived from protein, with 52% sourced from plant-based proteins and 47% from animal sources. Consequently, healthcare policymakers should prioritize addressing insufficient protein intake, particularly in regions with a high prevalence, by implementing effective interventions to prevent osteoporosis and sarcopenia.

Keywords: Protein, Osteoporosis, Sarcopenia, Prevention

P1106

CONSIDERATIONS IN DIGITAL INTERVENTIONS FOR MUSCULOSKELETAL AGEING: INSIGHTS FROM PATIENT AND PUBLIC INVOLVEMENT

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Objectives

This study aimed to explore the perceptions, barriers, and facilitators associated with adopting digital interventions for musculoskeletal health in UK older adults. By engaging older adults in evaluating two digital health platforms, DocHQ and ReMaker, the study sought to understand how such technologies can be tailored to improve accessibility, adherence, and health outcomes while addressing equity challenges.

Materials and Methods

A Patient and Public Involvement and Engagement (PPIE) workshop was conducted in June 2024 at the MRC Lifecourse Epidemiology Centre. Five older adults participated, receiving an educational presentation on musculoskeletal ageing, followed by live demonstrations of DocHQ (which offers AI-powered physiotherapy with real-time feedback) and ReMaker Move (which uses wearable technology to measure physical performance). Their feedback was recorded, transcribed, and thematically analysed. Key themes included continuity of care, accessibility, personalisation, and motivation.

Results

Participants valued the remote accessibility and instant feedback of the interventions, particularly for overcoming barriers such as limited mobility and hospital access. DocHQ and ReMaker devices provided valuable strength and movement assessments, promoting independence and motivation. Issues around access to technology, digital literacy, and cost were raised. Participants emphasised the need for continuity of care with clinicians, personalised exercises, and the potential benefits of periodic human interaction to sustain motivation and ensure safety.

Conclusions

Digital interventions like DocHQ and ReMaker hold promise for enhancing musculoskeletal health in older adults. To ensure equitable access and benefit, strategies must address barriers related to technology accessibility, digital support, and cost. Integrating these tools with personalized clinician support could improve adherence, mitigate health disparities, and promote musculoskeletal health across diverse populations.

P1107

DEXA SCAN FINDINGS AND THE ROLE OF FRAX IN MANAGING FRAGILITY FRACTURE PATIENTS AT A LEADING MALAYSIAN UNIVERSITY HOSPITAL

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INTRODUCTION:
Bone mineral density (BMD) is most commonly assessed through dual-energy x-ray absorption (DEXA) scans, which is widely recognised as the gold standard screening method for evaluating the risk of fragility fractures. This method is deemed as the preferred diagnostic tool for osteoporosis and is ideally performed on the hip and lumbar spine. BMD results are typically reported as T-scores, which represent deviations from the average bone density of a healthy, young adult. A T-score of -1 and above indicates normal bone density, a T-score between -1 and -2.5 is indicative of osteopenia, while a T-score of -2.5 or below indicates osteoporosis. While BMD remains a valuable diagnostic tool, the Fracture Risk Assessment Tool (FRAX) calculator offers a practical, accessible alternative for assessing fracture risk in settings where DEXA scans are unavailable or for patients where immediate screening is not feasible.

MATERIALS AND METHODS:
This study utilised a prospective design, conducted for a duration of 1.5 years; from January 2023 to July 2024. The inclusion criteria consisted of elderly Fracture Liaison Service (FLS) patients with fragility fractures, aged 55 years and above, who were scheduled for a BMD scan as outpatients. We excluded patients with severe trauma, malignancies or steroid-induced fractures. The hip T-score derived from the DEXA scan was chosen to determine their classification into normal, osteopenia or osteoporosis categories.

RESULTS AND DISCUSSION:
A total of 146 patients were included in the study, n=87 for the whole of 2023 and n=59 within the first six months of 2024. The age profile revealed that majority of patients who came for screening were aged between 71 and 80 years (45.9%, n=67), with the smallest group (1.4%, n=2) aged 51 to 60 years. Gender distribution on the other hand divulged that women represented the majority (87.7%, n=128), while the men constituted (12.3%, n=8). The predominance of females was expected given the osteoporosis trends.

Analysis of the DEXA scan results showed that 18.5% of patients exhibited normal bone density. Osteopenia was observed in 49.32% of patients, while 32.19% were classified as osteoporotic. This highlights that half of our study patients were osteopenic.

According to Clinical Practice Guidelines, (CPG) in 2022, DEXA readings are not a vital component in the initiation of anti-osteoporosis therapies but could serve as a monitoring tool instead. Patients on these therapies should be assessed for their treatment response. Hence, at the osteopenia stage, DEXA could serve as preventive strategy. The FRAX tool on the other hand could complement the evolving approach to osteoporosis management.

CONCLUSION:
Our findings underscore the importance of integrating FRAX with DEXA scans for a comprehensive approach to osteoporosis management, especially in high-risk populations to identify those who are prone to osteoporosis-related fractures. This dual strategy can ensure that none of the patients are under-treated and prevents any delay in the initiation of anti-osteoporosis medication.

P1108

MANAGEMENT TRENDS AND TIMING OF SURGICAL INTERVENTION IN ELDERLY PATIENTS WITH HIP FRACTURES: A RETROSPECTIVE ANALYSIS

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INTRODUCTION:
Hip fractures pose a major health challenge among elderly populations, often necessitating either surgical intervention or conservative treatment. Understanding the timing of surgical intervention and the distribution of conservative cases is vital for improving patient outcomes. This study explores the distribution of surgical versus conservative management trends in patients with hip fractures and evaluates the time to surgery for those undergoing operative treatment.

MATERIALS AND METHODS:
This study utilised a retrospective design, conducted throughout the entire year of 2024 from January to December. The inclusion criteria consisted of patients referred to the Fracture Liaison Service (FLS) throughout the year specifically for hip fractures which resulted in a total of 104 patients. Data analysis included the proportion of patients receiving surgery as compared to those who were managed conservatively and the time intervals from hospital admission to surgical intervention. The duration to surgery was categorised into four intervals: 0–3 days, 4–7 days, >7–14 days and >14 days, with an additional category for cases where the time to surgery was uncertain.

RESULTS AND DISCUSSION:
Out of the 104 patients, 83% (n=86) underwent surgery, while 17% (n=18) were treated conservatively. Among the surgical patients, 50% underwent surgery within 0–3 days, 24.4% within 4–7 days and 22.1% within >7–14 days. None of the patients had to wait longer than 14 days for surgery, however 3.5% had uncertain surgery timelines. These findings highlight that half of the patients received timely surgical intervention as they were treated within 3 days, following the stipulated timeframe provided by our hospital. Conservative management cases were reflective of either patient's treatment preferences or due to comorbidities which led to them being unfit for surgery. Current clinical guidelines underscore the importance of early surgical intervention to reduce complications, improve recovery and mobility as well as decreasing the risk of mortality.

CONCLUSION:
The study highlights that the majority of patients with hip fractures predominantly undergo surgical treatment, with a significant proportion receiving early intervention. This underscores the importance of prompt surgical decision-making in order to achieve optimal outcomes. Opposingly, for patients managed conservatively, tailored approaches remain essential. Further research is warranted to explore the long-term impacts of both surgical and conservative treatment modalities in this osteoporotic population.

P1109

MRI -T2 MAPPING OF CARTILAGE IN PATIENTS WITH OSTEOARTHRITIS OF THE KNEE JOINTS OF VARYING DURATION

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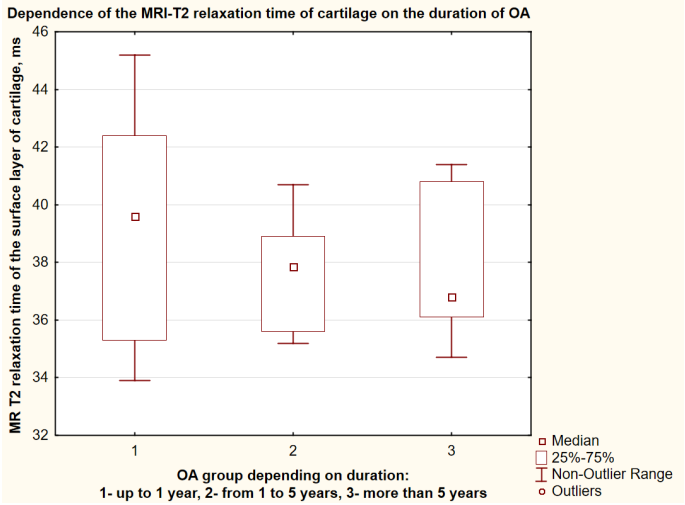
The purpose of the study. To determine the T2 relaxation time of articular cartilage (total, deep and surface layer) during MRI examination depending on the duration of osteoarthritis (OA).
Materials and methods. The prospective study for the period 2023-2024 included 45 women aged 35-75 years, with a reliable diagnosis of OA (ACR) of knee joints of stage I-III, who signed informed consent. The average age of the patients was 52.7±11.0 years, BMI was 28.9±7.7 kg/m2, and the median duration of the disease was 2 [1; 4] years. All patients were divided into three groups: group 1 (n=20) - patients with short-term OA (up to 1 year); group 2 (n=12) - patients with OA lasting from 1 year to 5 years; group 3 (n=13) - patients with OA lasting more than 5 years. years old. Quantitative signs of T2 relaxation time of articular cartilage (total, deep and surface layers) were evaluated in all groups during MRI examination. Statistical processing of the material was carried out using Statistica 10.0.
Results. In group 1, the MRI-T2 relaxation time in the deep cartilage layer was 34.0 [31.3; 34.9] ms, in the surface layer - 39.6 [35.3; 42.4] ms, in the total - 35.0 [31.7; 36.7] ms. In group 2, the MR-T2 relaxation time in the deep cartilage layer was 33.5 [31.9; 35.3] ms, in the surface layer - 37.8 [35.6; 38.9] ms, in the total - 34.6 [33.8; 35.2] ms. In group 3, the MR-T2 relaxation time in the deep cartilage layer was 34.5 [32.2; 35.3] ms, in the surface layer - 36.8 [36.1; 40.8], in the total - 36.1 [34.5; 38.0] ms. There were no statistically significant differences in the assessment of quantitative indicators of T2 relaxation time in all cartilage layers in the three groups. However, we noted a tendency to increase the T2 relaxation time in the surface layer of cartilage in patients with knee joint OA with a disease duration of up to 1 year (Figure 1).
Figure 1. Dependence of MRI-T2 relaxation time of the surface layer of cartilage on the duration of OA



Conclusion. The results obtained show a tendency to increase the T2 relaxation time in the superficial cartilage layer in patients with knee joint OA of short duration (up to 1 year), which may allow us to consider this indicator as one of the signs of disease progression in the future, and requires further study and comparison with clinical data.

P1110

THE RELATIONSHIP OF DEEP CARTILAGE LESIONS WITH ANTHROPOMETRIC AND LABORATORY PARAMETERS IN PATIENTS WITH KNEE OSTEOARTHRITIS OF VARIOUS DURATION

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The purpose of the study. To determine the influence of anthropometric and laboratory parameters on the development of deep cartilage lesions (DCL) in patients with osteoarthritis (OA) of the knee joints (KJ).
Materials and methods. A prospective study included 45 women with a diagnosis of OA (ACR) of KJ stage I—III (Kellgren — Lawrence). The age of the patients was 52.7±11.0 years, the body mass index was 28.5 ± 7.4 kg/m2, and the duration was 2 [1;4] years. All underwent magnetic resonance imaging (MRI) using WORMS: 0 - normal thickness and signal, 1 - normal thickness, increased signal; 2 - focal defect with a width of <1 cm not to the full depth; 3 - multiple partial defects not to the full depth, alternating with areas of normal thickness <75% of the area; 4 - Diffuse (≥ 75% of the area) partial thickness loss; 5 - multiple areas of total thickness loss <75% of the area; 6 - diffuse (≥75% of the area) loss of total thickness. The presence of DCL was established in the case of belonging to grades 4-6 in accordance with the above gradation. Statistical processing of the material was carried out using Statistica 10.0.
Results. Depending on the presence or absence of DCL, all patients were divided into 2 groups: 22% with DCL (n=22) and 78%

without it (n=35). Individuals with DCL were comparable in age, pain level according to VAS and WOMAC, as well as duration of NSAID and SYSADOA use with patients without DCL. Patients with DCL had a longer duration of the disease (10 [3;13] and 1 [0.8;3] years, p=0.001), higher weight (87.5 [80;101] and 70 [60;88.5] kg, p=0.04), body mass index (BMI) (32.1 [30.5;41.5] and 25.4 [22.2; 30.9] kg/m2, p=0.02) and triglyceride levels (1.7 [1.1;2.2] and 0.9 [0.7;1.3] mmol/l, p=0.02). In patients with short-term OA, it was found that multiple areas of partial and complete cartilage defects were detected in more than 50% of cases (Table 1).

Table 1 - Gradation of KJ cartilage damage depending on the duration of OA

Gradation of cartilage damage by WORMS	Duration of OA <1 year, n=20	The duration of OA >1 year, n=25
0	-	-
1	n=1 (5%)	n=1 (4%)
2	n=7 (35%)	n=3 (12%)
3	n=11 (55%)	n=12 (48%)
4	n=1 (5%)	n=8 (32%)
5	-	n=1 (4%)
6	-	-

Conclusion. DCL is associated with OA duration, increased weight, BMI and hypertriglyceridemia. GPH is detected even in patients with OA duration no more than 1 year, which makes MRI WORMS an extremely important method for detecting structural cartilage defects even in the presence of short-term pain in the KJ.

P1111

THE RELATIONSHIP OF MULTIPLE CARTILAGE DEFECTS WITH PRO-INFLAMMATORY CYTOKINES IN OSTEOARTHRITIS OF THE KNEE JOINTS OF SHORT DURATION

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The purpose of the study. To determine the relationship of cartilage damage with laboratory changes in osteoarthritis (OA) of the knee joints (KJ) of short duration.

Materials and methods. A prospective study for the period 2023-2024 included 69 women who met the ESKOA criteria, which are currently being developed and tested, with knee joint OA and X–ray stage I-II (Kellgren — Lawrence), who signed the informed consent. The average age of the patients was 44.8±8.0 years (from 35 to 66), the body mass index (BMI) was 25.5 ± 5.0 kg/m2, and the duration of knee pain was 0.8 [0.5; 1] years. All underwent magnetic resonance imaging (MRI) using WORMS: 0 - normal thickness and signal, 1 - normal thickness, increased signal; 2 - focal defect with a width of <1 cm not to the full depth; 3 - multiple partial defects not to the full depth, alternating with areas of normal thickness <75% of the area; 4 - Diffuse (≥ 75% of the area) partial thickness loss; 5 - multiple areas of total thickness loss <75% of the area; 6 - diffuse (≥75% of the area) loss of total thickness. Statistical processing of the material was carried out using Statistica 10.0.

Results. According to the WORMS grading, patients corresponded to the following categories: 0 – 1.5% of cases (n=1), 1 – 6% (n=4), 2 – 33% (n=23), 3 – 52% (n=36), 4 – 7% in (n=5); none of the patients had cartilage lesions corresponding to categories 5 and 6 according to WORMS MRI. Depending on the presence of multiple partial and/or complete cartilage defects according to WORMS MRI, all patients were divided into 2 groups: group 1 (n=48, 59%) with these defects and group 2 (n=28, 41%) without them. Patients in both groups were comparable in age, duration of the disease, BMI, waist and hip size, pain levels according to VAS and WOMAC, ESR and CRP, as well as duration of NSAID and SYSADOA administration. In group 1, there were higher levels of interleukin-6 (IL-6) compared with group 2 (0.28 [0.04; 0.36] pg/ml versus 0.03 [0.01; 0.08] pg/ml; p=0.005). The Spearman correlation analysis confirmed positive correlations (p <0.05) between the presence of multiple cartilage defects and higher IL-6 values (r=0,4).

Conclusion. In our study, it was shown that in patients with OA duration of no more than 1 year, more than 50% of cases already have multiple cartilage defects according to WORMS MRI. This study also demonstrated that the presence of more than 1 partial cartilage defect is associated with higher IL-6 levels, which may possibly indicate a significant role of inflammation in the development of OA.

P1112

EARLY KNEE OSTEOARTHRITIS: KEY PREDICTORS OF PAIN

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Objective: to investigate key risk factors associated with pain in early-stage knee osteoarthritis (OA).

Materials and Methods: The study included 109 women aged 35–70 with knee pain for ≤1 year and minimal radiographic changes (Kellgren-Lawrence 0–II, no significant JSN). Anthropometric data, medical history, clinical examination results, and scores (VAS, WOMAC, KOOS, overall health) were documented. Radiography, ultrasound, and laboratory tests were performed.

Results: pain intensity ≥40 mm on the VAS was observed in 15% of patients (n=16). These patients were older (52.5 (42; 62.5) vs. 44 (38; 52) years, p=0.02), had higher BMI (28 (25; 31.6) vs. 24 (21; 28) kg/m², p=0.04), worse total WOMAC scores (1245 (872; 1510) vs. 248 (90; 410) mm, p<0.001), lower total KOOS scores (44 (37; 67) vs. 79 (63; 88)%, p<0.001), and poorer overall health (60 (47; 80) vs. 29.5 (10; 50) mm, p<0.001). Synovitis (50% vs. 13.9%, p<0.001), history of synovitis (75% vs. 31.1%, p=0.008),

and US-detected osteophytes (50% vs. 10.75%, p<0.001) were more frequent. Metabolic syndrome (MetS) (56.25% vs. 25.8%, p=0.03) was also more common.

Discriminant analysis revealed significant risk factors for pain (Table 1): physical function (PF) (WOMAC), synovitis, osteophytes, and MetS. A predictive formula was developed:

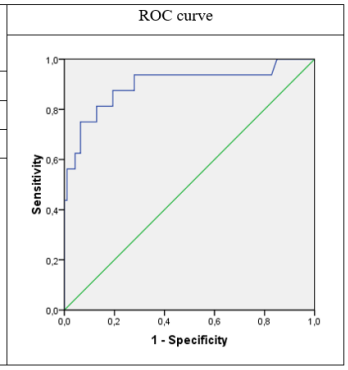
(0.012 × PF) + (3.03 × MetS) + (3.38 × osteophytes) + (2.14 × synovitis) ≥ 14.1.

Here, PF are measured in mm; MetS is coded as 0 (absent) or 1 (present); US-detected osteophytes and synovitis as 1 (absent) or 2 (present).

The formula demonstrated high predictive accuracy (90.8%), confirmed by ROC analysis (AUC: 0.898, 95% CI: 0.794–1.002).

Table 1. Coefficients of the discriminant function for pain prediction in early-stage knee

Factors	Coefficients
Physical function (WOMAC)	0.012
US-detected osteophyte	3.38
Metabolic syndrome	3.03
Synovitis	2.14



Conclusions: Pain in early-stage knee OA is linked to functional impairments (WOMAC), synovitis, US-detected osteophytes and MetS.

P1113

THERAPEUTIC OPTIONS FOR TARGETING INFLAMMATORY OSTEOARTHRITIS

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Objective: to investigate the efficacy and safety of olokizumab (OKZ) in patients with knee osteoarthritis (OA) with synovitis, persistent pain, and ineffectiveness of previous conservative therapy.

Materials and Methods: the study included 15 patients with stage II–III knee OA who met ACR criteria, had pain ≥50 mm on the VAS, synovitis, and treatment failure. Patient age ranged from 54 to 75 years; disease duration was 1–23 years. Over 12 weeks, patients received three subcutaneous injections of OKZ (64 mg). Effectiveness was assessed by changes in pain intensity (VAS, WOMAC, KOOS), DN4 outcomes, and EQ-5D quality of life. GHA via VAS, physician/patient efficacy ratings, and the need for NSAIDs were also considered. All patients underwent laboratory testing.

Results: therapy significantly reduced pain on VAS (65 (55–75) mm to 38 (19–42) mm, p=0.001) and improved KOOS scores: pain (44.4 (33.3–55.6)% to 63.9 (50–66.7)%, p<0.01), symptoms (50 (35.7–57.1)% to 64.3 (53.6–67.9)%, p<0.05), daily living (47.1 (35.3–50)% to 57.8 (51.5–70.6)%, p=0.003), and quality of life (25 (12.5–43.8)% to 43.8 (31.3–70.6)%, p<0.05). Quality of life by EQ-5D improved from 0.52 (-0.02–0.52) to 0.52 (0.52–0.68), p=0.01. GHA improved from 55 (40–60) mm to 70 (60–75) mm, p=0.001, hsCRP (2.9 (1–4) mg/L to 0.35 (0.2–0.95), p<0.005) and ESR (13 (4–22) mm/h to 2 (2–4), p<0.005) also decreased significantly.

Adverse events (AE) were reported in 4 patients. Two discontinued OKZ due to serious AEs: bilateral pneumonia of unknown etiology requiring hospitalization and allergic dermatitis affecting hands, chest area, and back. In 2 cases, ALT elevations were observed but did not require treatment.

Conclusion: OKZ demonstrated significant symptomatic and anti-inflammatory effects in patients with the inflammatory phenotype of OA. Further research is needed to confirm its efficacy and safety.

P1114

ASSOCIATION OF LEPTIN WITH EARLY-STAGE KNEE OSTEOARTHRITIS

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Objective: to evaluate the relationship between hyperleptinemia and clinical, instrumental, laboratory parameters in patients with early-stage knee osteoarthritis (OA).

Material and Methods: the study included 50 women (mean age: 44.6±7.3 years, range 35–64; BMI: 25.3±5.1 kg/m²) with knee pain for ≤1 year and minimal radiographic changes (Kellgren-Lawrence 0–II, no significant JSN). Anthropometric data, medical history, clinical examination, and pain scores (VAS, WOMAC, KOOS) were recorded. Radiography and lab tests were performed.

Results: hyperleptinemia (leptin ≥11.1 ng/mL) was found in 37 patients (74%). Patients were divided into two groups by leptin levels (Table 1). Groups were similar in age but differed in BMI, waist, and hip circumference (p<0.05). Hyperleptinemic patients had higher WOMAC pain scores (p=0.04), smaller medial JSW (p<0.001), more frequent MetS (p=0.02), more MetS components (p=0.01), and higher fasting glucose (p=0.01).

Table 1. Comparative characteristics of patients with and without hyperleptinemia

Parameter	Patients with Hyperleptinemia (n=37)	Patients without Hyperleptinemia (n=13)	p-value
Age, years, Me	44 (40; 52)	39 (36; 45)	0.06
BMI, kg/m², Me	26.3 (23; 29)	21 (19.7; 22)	<0.001
Waist circumference, cm, Me	82 (75; 90)	70 (70; 74)	<0.001
Hip circumference, cm, Me	101 (98; 107)	94 (90; 96)	<0.001
Pain (WOMAC), mm, Me	60 (30; 140)	30 (10; 40)	0.04
MetS, %	32.4	0	0.02
MetS components, Me	1 (1; 2)	1 (0; 1)	0.01
Medial JSW, mm, Me	3.9 (3.4; 4.3)	4.5 (4.3; 4.8)	<0.001
Glucose, µmol/L, Me	5.3 (5; 5.7)	5 (4.9; 5.3)	0.01

Leptin correlated with WOMAC pain (r=0.3, p=0.04), BMI (r=0.6, p<0.001), waist (r=0.6, p<0.001), hip circumference (r=0.4, p<0.001), hyperglycemia (r=0.4, p=0.01), MetS (r=0.3, p=0.01), and MetS components (r=0.4, p=0.004). Leptin was inversely correlated with medial JSW (r=−0.5, p<0.001).
Conclusions: hyperleptinemia in women with early-stage knee OA is associated with higher WOMAC pain scores, narrower medial JSW, and metabolic disturbances. Understanding the mechanisms linking hyperleptinemia to OA is essential for developing preventive and therapeutic strategies.

P1115

THE IMPACT OF METABOLIC SYNDROME ON CLINICAL MANIFESTATIONS OF EARLY-STAGE KNEE OSTEOARTHRITIS

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Objective: to evaluate the impact of metabolic syndrome (MetS) on the clinical manifestations of early-stage knee osteoarthritis (OA).
Materials and Methods: the study included 93 women aged 35–64 with knee pain for ≤1 year and minimal radiographic changes (Kellgren-Lawrence 0–II, no significant JSN). Anthropometric data, medical history, clinical examination results, and scores (VAS, WOMAC, KOOS, overall health) were documented. All patients underwent laboratory testing.
Results: MetS was diagnosed in 18% of patients (n=17). Based on the presence or absence of MetS, patients were divided into two age-matched groups. Patients with MetS showed higher rates of hypertension (p < 0.001), hypertriglyceridemia (p = 0.002), low HDL (p = 0.004), elevated LDL (p = 0.01), hyperglycemia (p < 0.001), and obesity (p < 0.001). They also had higher VAS pain scores (p = 0.01), total WOMAC (p = 0.04), and overall health scores (p = 0.01), along with worse KOOS Pain (p = 0.04) and activities of daily living (ADL) (p = 0.04).

Table 1. Comparative characteristics of patients with and without metabolic syndrome

Parameter	Patients with MetS (n=17)	Patients without MetS (n=77)	p-value
Arterial hypertension, %	53	5	<0.001
Hypertriglyceridemia, %	29	3	0.002
Reduced HDL, %	29.4	4	0.004
Elevated LDL cholesterol, %	88	57	0.01
Hyperglycemia, %	29	0	<0.001
Obesity, %	53	4	<0.001
Pain VAS (mm), Me	45 [15; 60]	20 [10; 40]	0.01
Total WOMAC (mm), Me	640 [140; 790]	244 [84; 395]	0.04
Overall health (mm), Me	40 [35; 55]	21 [10; 50]	0.01
KOOS Pain, %, Me	78 [56; 86]	83 [75; 92]	0.04
KOOS ADL, %, Me	78 [68; 90]	90 [76; 96]	0.04

Spearman analysis showed positive correlations of MetS with VAS pain (r = 0.3, p = 0.01), total WOMAC (r = 0.2, p = 0.04), and overall health (r = 0.3, p = 0.01), and negative correlations with KOOS Pain (r = -0.2, p = 0.04) and ADL (r = -0.2, p = 0.04).
Conclusion: the presence of MetS is associated with more severe clinical manifestations of early-stage knee OA. Addressing metabolic disturbances may contribute to reducing pain intensity and improving outcomes for patients with early-stage OA.

P1116

PREDICTORS OF INFLAMMATORY PHENOTYPE KNEE OSTEOARTHRITIS PROGRESSION

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Purpose: to determine the factors of inflammatory phenotype knee osteoarthritis (OA) progression
Methods. The prospective study included 51 patients aged 40-75 with knee OA (according to ACR criteria) stages I-III (Kellgren J.- Lawrence J) who signed informed consent. The average age was 54.1 ± 11.1 and the duration of OA was 3.5 (1-11) years. The average BMI was 32.4 ± 7.6 kg/m2. Persistent knee synovitis, confirmed by ultrasound data, was the main parameter for determining the inflammatory phenotype of OA. The duration of the study is 3 years.

Results. During the follow–up period, progression of knee OA was noted in 19.6% of patients (n=10). Patients were divided into 2 groups (Table 1), according to the presence or absence of OA progression. The patients in both groups did not differ in age (p=0.19) and duration of OA (0.15). Worse pain scores were determined by WOMAC and its other components in patients with knee OA progression. When comparing the groups, patients with knee OA progression showed higher rates of systemic inflammation (increasing the level of CRP), hyperleptinemia, and increased production of extracellular cartilage matrix destruction markers (matrix metalloproteinase–9 (MMP-9)). Spearman's correlation analysis showed that the knee inflammatory OA progression is associated with knee pain according to WOMAC (r=0.58, p=0.004), multimorbidity (r=0.52, p=0.03) and hyperleptinemia (r=0.54, p=0.009).

Table 1. Comparative clinical and laboratory characteristics of patients with and without knee OA progression

Parameter	Knee OA progression n = 10	No knee OA progression n = 41	p
Pain WOMAC, мм, Me	255 [238,5; 275]	179,5 [100; 220]	0,007
Total WOMAC, мм, Me	1107,5 [1000,5; 1338,5]	824,5 [505; 1100]	0,05
MPP-9, ng/ml, Me	4 [1,14; 13,0]	1,4 [0,4; 4]	0,02
CRP, mg/l, Me	6,9 [1,9; 9,8]	1,5 [0,7; 3,0]	0,04
Leptin, ng/ml, Me	82,4 [67,2; 128,2]	37,2 [25,7; 48,0]	0,001

Conclusions. The main predictors of the inflammatory phenotype knee osteoarthritis progression are: pain, increased leptin levels, and multimorbidity. Therapeutic interventions aimed at these factors will improve the course of the inflammatory phenotype of knee OA.

P1117

THE EFFECT OF BONE METABOLISM MARKERS ON THE COURSE KNEE OSTEOARTHRITIS

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Objective: to study the effect of bone metabolism markers (Cathepsin K and runx2) on the course of knee osteoarthritis (OA)
Material and Methods. The prospective study included 352 patients with knee OA (according to ACR criteria) X-ray stage I-III (Kellgren J.- Lawrence J) who signed informed consent. The average age was 58.3 ± 9.3 years, the duration of OA was 6.0 [2;12] years. Cathepsin K was detected in 56 patients, runx2 in 89. The duration of the study is 3 years.
Results: 73.2% of patients had an increase in the expression of the Cathepsin K gene, and 80.0% had an increase in the expression of the runx2 gene. A comparative analysis showed that patients with Cathepsin K gene expression had lower KOOS scores (48 [34; 58] vs. 60 [48; 78] points, p=0.024 and higher DN4 scores (3 [2; 4] vs. 1 [0; 3] points, p=0.01). The Spearman correlation analysis confirmed positive correlations (p < 0.05) between the expression of the Cathepsin K gene and DN4 (r=0,37, p=0.007) and negative correlations with the total KOOS scores (r=-0,33, p=0.02). Patients with runx2 gene expression had higher values of synovial membrane thickness according to ultrasound (US) (3.0 [2.7; 3.2] vs. 2.4 [2.1; 2.7] mm, p=0.0005), lower values of total hip BMD: (0.90 [0.79; 0.95] vs. 0.99 [0.90; 1.0] (g/cm2), p=0.02) and of total hip T-score: (-0.3 [-1.2; 0.1] vs. 0.4 [-0.3; 0.8], p=0.03). The Spearman correlation analysis confirmed positive correlations (p < 0.05) between the expression of the runx2 gene and the thickness of the synovial membrane (US) and negative correlations with total hip BMD and the total hip T-score (Table 1)

Table 1 – Correlation coefficients of runx2 gene expression with OA risk factors and progression

Parameter	r	p
Synovial membrane thickness (US), mm	0,40	0,0003
Total hip BMD, (g/cm2)	-0,31	0,02
Total hip T-score	-0,31	0,02

Conclusions. Increased expression of Cathepsin K and runx2 genes may contribute to the degradation of the cartilage matrix during the OA progression. Cathepsin K and runx2 can serve as new molecular targets not only for assessing the OA progression, but also for the development of new drugs for the OA treatment aimed at reducing pain and inflammation.

P1118

THE EFFECT OF HYPERURICEMIA IN THE METABOLIC PHENOTYPE OF KNEE OSTEOARTHRITIS

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Objective: to evaluate the effect of hyperuricemia (HU) on the course of knee osteoarthritis (OA) associated with metabolic syndrome (MS).
Material and Methods. The prospective study included 111 patients aged 40-75 with knee OA (according to ACR criteria) stage I-III (Kellgren J.- Lawrence J) and MS, who signed informed consent. The average age was 61 (54; 67.5), the duration of OA was 6 years (3; 14.5). The uric acid level of more than 360 mmol/l was determined as HU. The duration of the study is 3 years.
Results. Patients with OA were divided into 2 groups according to the presence or absence of HU (Table 1). Patients with the metabolic phenotype of OA with and without HU were comparable in age and duration of OA. In patients with the metabolic phenotype of OA and HU, worse indicators of the course of OA were deter-

mined: higher VAS pain, knee varus deformity and hypotrophy of the quadriceps femoris muscle were more often recorded, as well as more severe functional insufficiency (use of walking aids). During laboratory and instrumental examination, patients in the group with HU had a lower thickness of posterior lateral cartilage and higher levels of matrix metalloproteinase-3 (MMP-3).

Table 1 – Comparative characteristics of patients with knee OA and MS depending on the presence/absence of HU

Parameter	Patients with MS and without HU (n=62)	Patients with MS and HU (n=49)	P
BMI, kg/m², Me	31,4 [27,9; 35,4]	33,5 [30,85; 37,8]	0,009
Knee VAS pain >40 mm, %	62,9	80,85	0,042
Knee varus deformity, %	14,5	34,8	0,014
Using a walking stick, %	8,2	24,4	0,02
Hypotrophy of the quadriceps femoris muscle,%	33,9	55,1	0,025
Thickness of posterior lateral cartilage mm, Me	1,6 [1,5; 1,7]	1,6 [1,5; 1,6]	0,017
MMP-3, Me	16,5 [12,1; 22,4]	23,9 [16,3; 28,4]	0,035

Conclusions. HU in patients with the metabolic phenotype OA is an additional factor contributing to a more severe course of OA. In this regard, it is necessary to develop therapeutic measures for metabolic OA aimed at correcting urate metabolism, which will help reduce the risk of severe OA.

P1119

PREDICTORS OF KNEE OSTEOARTHRITIS PROGRESSION WITH A SHORT DURATION OF THE DISEASE (LESS THAN 5 YEARS)

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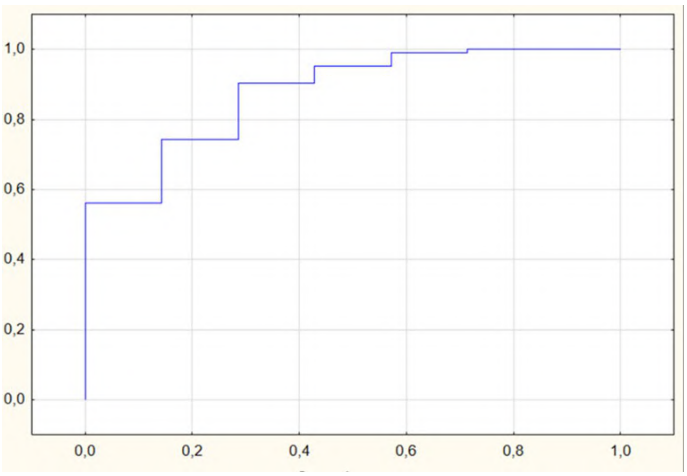
Objective: to determine the factors of knee osteoarthritis (OA) progression with a short duration of the OA (less than 5 years).

Material and Methods. The prospective study included 218 patients with knee OA (according to ACR criteria) of stage I-III (Kellgren J.- Lawrence J) who signed informed consent. The average age was 53.5 [46.0; 61.0] years. The duration of the study is 3 years.

Results. During the follow—up period, progression of knee OA was noted in 25% of patients. Patients were divided into 2 groups according to the presence or absence of OA progression. The patients of both groups did not differ in age (p=0.45) and duration of OA (p=0.45), however, patients from the progression group had statistically significantly higher values: BMI (p= 0.002), knee VAS pain (p=0.0001), WOMAC pain (p=0.0002), WOMAC functional insufficiency (p=0.002), lumbar spine bone mineral density (BMD) (p=0.03); diabetes mellitus was more often diagnosed (p=0.0094), knee varus deformity (p=0.02), knee synovitis (according to ultrasound) (p=0.003) and osteitis in the medial tibia (according to MRI) (p<0.001). As a result of correlation and discriminant analysis, the following risk factors for the progression of OA with a short duration of OA were identified: knee pain, BMI, osteitis in the medial tibia, lumbar spine BMD. To clarify the prognosis of OA progression, as well as to illustrate the predictive power of the factors included in the multifactorial model during discriminant analysis, a ROC curve was constructed (Fig. 1). The area under the ROC curve reflects the accuracy of the forecast and is 0.88 in the model used (the range 0.8–0.9 corresponds to a very good quality model).

Conclusions. A prospective study showed that high BMI, knee pain, osteitis in the medial tibia, and high lumbar spine BMD determine the risk of knee OA progression in patients with a short duration of the OA.

Figure 1 - ROC - curve of the sensitivity/specificity ratio for predicting the knee OA progression (area under the curve = 0.88)



P1120

THE EFFECT OF COLECALCIFEROL ON THE COURSE OF KNEE OSTEOARTHRITIS

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Objective: to study the effect of colecalciferol on the course of knee osteoarthritis (KOA)

Material and Methods. The study included 171 patients aged 40-75, with a reliable diagnosis of KOA stages I-III according to Kellgren-Lawrence, who signed informed consent. The mean age was 53.5 ± 9.94, BMI 29.8 ± 6.4kg/m², and KOA duration 3 [1, 7] years.

Results. Normal vitamin D levels (≥ 30 ng/ml) were found in 62 patients (36.3%): group 1. Reduced vitamin D levels (< 30ng/ml) was found in 109 patients: insufficiency (20-30ng / ml) - 66

(38,6%) - group 2; deficiency (<20ng/ ml) -43 (25,1%) -group 3. Patients from the groups were similar in terms of age and KOA duration, but patients in groups 2 and 3 had significantly higher body weight, BMI, VAS pain, WOMAC, worse patient's general health status and KOOS data. They were more likely to have hip OA and hand OA, clinically diagnosed knee synovitis, flat foot and quadriceps hypotrophy. Fewer patients were engaged in physical therapy, took calcium and vitamin D supplementation, and had concomitant conditions such as coronary heart disease, hypertriglyceridemia and hypertension. Also, these patients were significantly more likely to have higher concentrations of CRP, leptin, glycated hemoglobin, glucose, and alkaline phosphatase. Ultrasound examination revealed smaller sizes of cartilage tissue more often on both the anterior medial and anterior lateral surfaces of the knee; MRI showed osteitis in the medial femur and tibia more often ($p < 0.05$ for all values). Spearman's correlation analysis confirms the relationship between vitamin D deficiency and the following indicators (Table 1).

Table -1 Correlation coefficients between vitamin D deficiency and OA-related factors

Parameter	r	p
BMI	-0,35	0,002
OA stage	-0,26	0,002
Synovitis	-0,25	0,003
VAS pain	-0,29	0,04
WOMAC pain	-0,29	0,04
Total KOOS	0,23	0,02
The size of cartilage on the anterior medial surface	0,20	0,04
Osteitis in the medial femur	-0,29	0,01
Osteitis in the medial tibia	-0,12	0,02

Conclusions. Vitamin D deficiency/ insufficiency is associated with a more severe course of KOA. Therapeutic measures aimed at restoring the level of colecalciferol, and these factors can improve the course of the KOA.

P1121

THE EFFECT OF BONE MINERAL DENSITY OF THE AXIAL SKELETON ON THE KNEE OSTEOARTHRITIS COURSE

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Objective: To study the effect of bone mineral density (BMD) on the course of knee osteoarthritis (OA).

Material and Methods. The study included 352 patients aged 40-75, with a reliable diagnosis of KOA (ACR) stages I-III according to Kellgren-Lawrence, who signed informed consent. Of these, 164 had low BMD (osteoporosis / osteopenia), while 188 had normal levels. The average age was 58.3 ± 9.3 years, BMI was 29.5 ±5.4 and the median duration of OA was 6 (2-12) years. Individual cards were filled out for each patient including anthropometric data, medical history, clinical examination, assessment of VAS pain, WOMAC, KOOS, DN4, patient's general health status (GHS). All patients had laboratory tests, standard DEXA, knee X-rays and knee US.

Results. A comparative analysis showed that patients with osteoporosis/osteopenia and norm were comparable in age and duration of OA, however, patients with low BMD had a higher VAS pain (50 [40; 65] versus 40 [25; 58] mm, p=0.03), worse GHS values (47 [34; 55] versus 35 [15; 55] mm, p=0.003), worse KOOS values (50 [38; 58] versus 68 [44; 85] points, p=0.004), smaller osteophyte sizes in the medial femoral and tibial bones (2.0 [1.3; 3.8] versus 4.7 [2.0; 6.7] mm, p = 0.02 and 1.4 [0.8; 2.5] versus 2.4 [1.5; 3.9] mm, p = 0.02), a more pronounced thickness of the knee synovial membrane (US) (3.0 (2.8; 3.2) versus 2.9 (2.4; 3.1), p = 0.01), high values of alkaline phosphatase (85.0 [77.0; 94.0] versus 70.0 [56.0; 84.0] IU/l, p=0.0007) and glycated hemoglobin (5.6 [5.2; 5.9] versus 5.3 [4.8; 5.7] %, p=0.005). The Spearman correlation analysis confirmed positive associations ($p < 0.05$) between the low BMD and worse GHS values, the thickness of the synovial membrane (US), glycated hemoglobin, alkaline phosphatase, and negative relationships with the total KOOS, the osteophyte sizes in the medial femoral and tibial bones (according to X-ray) (Table 1).

Table 1 – Correlation coefficients between the "osteoporotic" phenotype and OA risk factors

Parameter	r	p
KOOS, points	-0,27	0,004
GHS, mm	0,20	0,03
The thickness of the synovial membrane (US), mm	0,24	0,01
The osteophyte sizes in the medial femur, mm	-0,30	0,02
The osteophyte sizes in the medial tibia, mm	-0,29	0,03
Glycated hemoglobin, %	0,29	0,004
Alkaline phosphatase, IU/l	0,31	<0,0001

Conclusions. Patients with the "osteoporotic" phenotype have a more severe course of OA: higher pain, knee synovitis was more often detected, worse values GHS and KOOS than in patients with normal BMD.

P1122

PREDICTORS OF KNEE OSTEOARTHRITIS PROGRESSION (LONG-TERM PROSPECTIVE STUDY)

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Objective: to identify the main risk factors for the knee osteoarthritis (OA) progression

Material and Methods. A 3-year prospective study included 352 patients with a reliable knee OA (ACR) stages I-III (Kellgren J.-Lawrence J), aged 40-75, average age was 58.3 ± 9.3, BMI – 29.5 ± 5.4 kg/m2, median duration of OA was 6 [2-12] years, who signed the informed consent. An individual card was filled out for each patient, including anthropometric indicators, medical history and clinical examination data, assessment of knee pain according to VAS, WOMAC, KOOS, DN4, and the patient's general health status (GHS). All patients underwent laboratory diagnostics, standard knee X-ray, knee ultrasound (US), knee MRI and DEXA.

Results. During the follow-up period, knee OA progression was noted in 22% of patients. Patients divided into two groups according to absence/presence knee OA progression. Patients in both groups did not differ in age (p>0.05) and duration of OA (p>0.05). Patients with knee OA progression had statistically significant higher BMI values (31.7±6.5 vs. 28.4±5.9 kg/cm2, p = 0.02), knee VAS pain (58.1±16.4 versus 49.2±15.8 mm, p = 0.003), knee varus deformity was more often detected (37.5% versus 22.9%, p<0.05), synovitis (US) was more often detected (3.2 [2.9; 3.4] versus 2.8 [2.4; 3.2] mm, p = 0.01), osteitis in the medial tibia (MRI) (65.4% vs. 21.1%, p=0.001), higher femoral neck and lumbar spine BMD (DEXA) (63.1% vs. 44.3% and 43.5 vs. 34.3%, respectively). The Spearman correlation analysis revealed significant associations (p < 0.05 for all cases) between knee OA progression and the following factors (Table 1).

Table 1 – Spearman correlation analysis between knee OA progression and the following factors (correlation coefficients)

Parameter	r	p
BMI	0,32	0,03
Knee VAS pain	0,42	0,02
Knee varus deformity	0,30	0,02
Femoral neck BMD	0,36	0,03
Knee synovitis (US)	0,37	0,03
Osteitis in the medial tibia	0,32	<0,0001

Conclusions. As a result of the study, risk factors associated with the knee OA progression have been identified. Timely therapeutic measures aimed at these factors can improve the course of knee OA.

P1123

THE EFFICACY OF BIOACTIVE CONCENTRATE OF SMALL MARINE FISH IN PATIENTS WITH GENERALIZED OSTEOARTHRITIS

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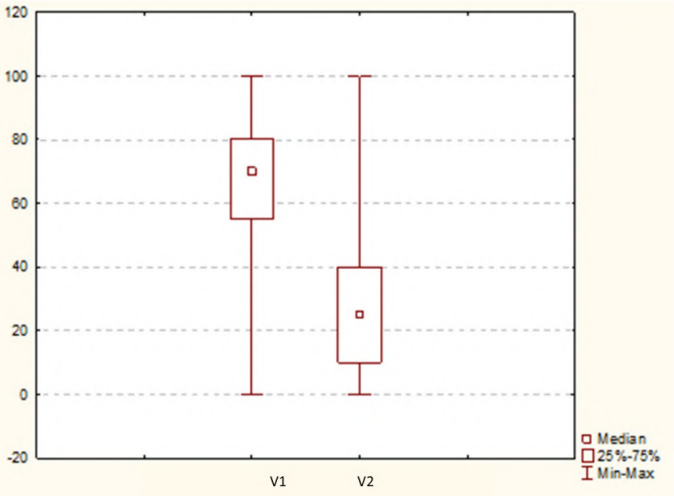
Objective. To evaluate the efficacy of SYSADOA (bioactive concentrate of small marine fish (BCSMF) containing chondroitin sulfate, amino acids, peptides, sodium, potassium, calcium, magnesium, iron, copper and zinc ions) in patients with generalized osteoarthritis (OA) in the multicenter observational study.

Materials and methods. The study included 22,525 patients with OA, including 1,694 with generalized OA (affecting three or more groups of joints). The following localizations were taken into account: hands, knee, hip and spine. The median age was 67 (60-72) years, and the body mass index (BMI) was 28.4 (25.7-31.6) kg/m2, the duration of the OA was 96 (60-132) months. BCSMF was prescribed 1 ml intramuscular daily No. 20 or 2 ml intramuscular every other day No. 10. The duration of the study is from 20 to 31 days, the number of visits is 2: visit 1 (V1) – the beginning of therapy, visit 2 (V2) – within 10 days after the completion of the 1st course of treatment. The effectiveness of treatment was assessed by the dynamics of pain (VAS), assessment of quality of life according to the EQ-5D and patient's general health status (GHS) according to VAS.

Results. Against the background of one course of the BCSMF there was a significant decrease in pain (at the beginning of the study – 70 (55-80) and at the end of therapy – 25 (10-40) mm, p<0.0001, Fig.1), improved quality of life according to EQ-5D (0.52 (from -0.02 to 0.59) and 0.76 (from 0.62 up to 1.0), p<0.0001) and GHS (50 (30-60) and 80 (60-90) mm, p<0.0001, respectively). A decrease in the need for NSAIDs was revealed: 79.9% took NSAIDs at the beginning of therapy, 68.3% at the end (relative risk, RR = 1.17, 95 CI 1.12 – 1.22, p<0.0001). Good response to treatment (pain reduction by 50% or more) it was detected in 64.5% of patients; 89.7% had a reduction in VAS pain of less than 40 mm. Older age, female sex (RR = 1.08, 95 CI 1.02 – 1.16, p=0.02), longer duration of the disease, worse values for EQ-5D, III-IV X-ray stages of the OA (RR = 1.32, 95 CI 1.19 – 1.48, p=0.000), coronary heart disease (RR = 1.21, 95 CI 1.07 – 1.37, p = 0.003), chronic heart failure (RR = 1.61, 95 CI 1.33 – 1.95, p < 0.0001) and obesity (RR = 1.4, 95 CI 1.23 – 1.58, p < 0.0001) were associated with a lower effect of the therapy in generalized OA (pain reduction by less than 50%).

Conclusion. The use of BCSMF in generalized OA has shown the expediency of its widespread use in clinical practice. To increase the effectiveness of therapy, it is necessary to take into account factors that reduce the analgesic effect of the BCSMF.

Fig.1 Dynamics of pain (according to VAS) in generalized OA therapy



P1124

THE EFFICACY OF BIOACTIVE CONCENTRATE OF SMALL MARINE FISH IN PATIENTS WITH HIP OSTEOARTHRITIS

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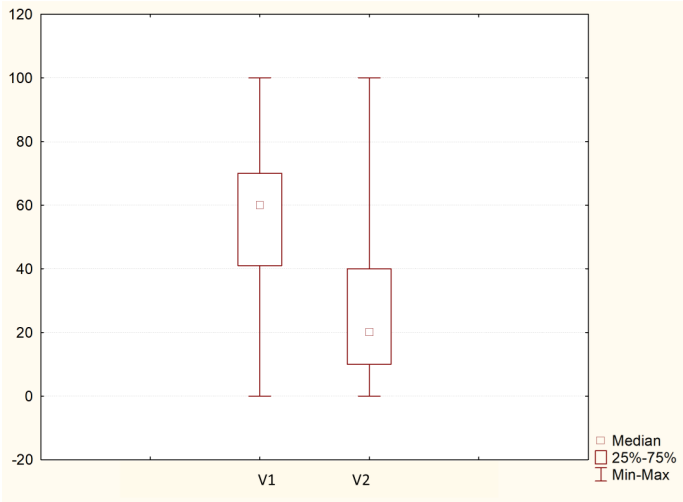
Objective. To evaluate the efficacy of SYSADOA (bioactive concentrate of small marine fish (BCSMF) containing chondroitin sulfate, amino acids, peptides, sodium, potassium, calcium, magnesium, iron, copper and zinc ions) in patients with hip osteoarthritis (OA) in the multicenter observational study.

Materials and methods. The study included 6666 patients with hip OA (according to criteria ACR). The median age was 59 (50-67) years, body mass index (BMI) was 27.1 (24.7- 29.7) kg/m2, and the duration of the hip OA was 60 (24-96) months. The duration of the study is from 20 to 31 days, the number of visits is 2: visit 1 (V1) – the beginning of therapy, visit 2 (V2) – within 10 days after the completion of the 1st course of treatment. BCSMF was prescribed 1 ml intramuscular daily No. 20 or 2 ml intramuscular every other day No. 10. The effectiveness of treatment was assessed by the dynamics of pain (VAS), assessment of quality of life according to the EQ-5D and patient's general health status (GHS) according to VAS.

Results. On the background of one course of the BCSMF, there was a significant decrease in pain (V1 – 60 [33; 70] and V2 – 20 [10; 40] mm, p<0.0001, Fig.1), an improvement in the quality of life according to EQ-5D (V1 – 0.52 [0.06; 0.69] and V2 – 0.8 [0.69; 1] points, p<0.0001) and GHS (V1 – 50 [30; 65] and V2 – 80 [60; 90] mm, p<0.0001). Respectively, the median reduction in pain (according to VAS) was 57.1% and the improvement of GHS (according to VAS) was 40%. Against the background of therapy, the need for NSAIDs decreased: at the beginning of therapy, 67.9% of patients received NSAIDs, at the end of treatment 64.9% (relative risk (RR) = 1.09, 95% CI 1.04 - 1.15, p<0.0001). Good response to therapy (pain reduction by 50% or more) it was detected in 63.6%; a decrease in VAS pain of less than 40 mm was observed in 83.3% of patients. Older age, female sex, longer duration of OA, worse values for EQ-5D, III-IV X-ray stages (RR = 1.19, 95 CI 1.02 – 1.14, p < 0.0001), coronary heart disease (RR = 1.43, 95 CI 1.33 – 1.55, p < 0.0001), chronic heart failure (RR = 1.61, 95 CI 1.42 – 1.83, p < 0.0001) and obesity (RR = 1.09, 95 CI 1.01 – 1.18, p < 0.0001) were associated with a lower effect of hip OA therapy (pain reduction by less than 50%).

Conclusion. The use of BCSMF in hip OA demonstrates its effectiveness and the possibility of widespread use in clinical practice. Consideration and modification of factors related to the analgesic efficacy of the BCSMF will improve the results of OA therapy.

Fig. 1 – Dynamics of pain (according to VAS) in hip OA therapy



P1125

URIC ACID AND FUNCTIONAL MUSCLE STATUS IN RHEUMATOID ARTHRITIS PATIENTS

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Objective: to study the association of uric acid (UA) levels with skeletal muscle mass, strength and physical performance in women with rheumatoid arthritis (RA).

Material and methods. 130 women (median age 61 [53; 66] years) with confirmed RA who signed informed consent were examined. The study was approved by the local ethics committee. A clinical and laboratory examination was performed, including an assessment of muscle strength, physical performance. Dual-energy X-ray absorptiometry according to the "whole body" program was done.

Results. The median UA level was 262.8 [197.4; 310.5] μmol/l, the incidence of hyperuricemia was 9.2%. Positive correlations of UA with the total lean mass index (r=0.32, p<0.001), appendicular lean mass index (r=0.24, p=0.006) were established. These associations were confirmed in multiple linear regression analysis (b*=0.38, p<0.001 and b*=0.29, p<0.001, respectively). There was no association between the level of UA and RA parameters (duration of the disease, glucocorticoid intake, RF and ACCP se-

ropositivity, ESR, CRP and DAS28 index), as well as with muscle strength. A negative correlation between the level of UA and parameters of physical performance was found.
Conclusion. The frequency of hyperuricemia was 9.2% in women with RA. Multiple regression analysis confirmed an independent association between lean mass and UA level.

P1126

BODY COMPOSITION AND MUSCLE FUNCTIONAL STATUS IN PATIENTS WITH RHEUMATOID ARTHRITIS TREATED WITH BIOLOGICAL DISEASE-MODIFYING ANTIRHEUMATIC DRUGS

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Objective: to evaluate the body composition and functional status of skeletal muscles in women with RA, depending on the presence of treatment with biological disease-modifying antirheumatic drugs (bDMARDs).
Materials and methods. The study included 138 women (mean age 60.8±8.6 years) with confirmed RA who received bDMARDs (tumor necrosis factor α inhibitors – 18, rituximab – 30, abatacept – 19), and 71 patients treated with methotrexate. A clinical and laboratory examination, evaluation of body composition using dual-energy X-ray densitometry and tests to assess muscle strength and physical performance were carried out.
Results. Muscle mass, fat mass and BMD did not differ depending on the type of DMARDs. When evaluating muscle strength and physical performance of skeletal muscles, it was found that muscle strength did not differ depending on the type of DMARDs. At the same time, gait speed ≤0.8 m/s was less frequently determined among women receiving bDMARDs compared with those taking methotrexate ($p<0.001$). Significant correlations have been established between the presence of bDMARDs therapy and physical performance, assessed by the results of a short physical performance battery ($\tau=0.14$, $p=0.035$) and gait speed ($\tau=0.20$, $p=0.003$). Logistic regression analysis confirmed the relationship between bDMARDs therapy and the functional state of the skeletal muscles.
Conclusion. There were no differences in the body composition depending on the type of DMARDs. Therapy with bDMARDs was associated with a better functional status of skeletal muscles, estimated by gait speed and a short physical performance battery compared with methotrexate-only therapy.

P1127

URIC ACID AND BONE MINERAL DENSITY IN RHEUMATOID ARTHRITIS PATIENTS

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Objective: to assess the frequency of hyperuricemia (HU) and association of uric acid (UA) level with bone mineral density (BMD) in postmenopausal women with rheumatoid arthritis (RA).
Material and methods. 173 postmenopausal women with RA (aged 40-75 years) enrolled in the study. All patients underwent clinical and laboratory examination to determine the level of UA in the blood serum (spectrophotometry in fresh specimens; Cobas C311 analyzer). The level of MK>360 mmol/l was taken as HU. Dual-energy X-ray absorptiometry (DXA, Lunar prodigy, GE, USA) was performed to measure the BMD of lumbar spine (LS), femoral neck (FN) and total hip (TH). The study was approved by the local ethics committee.
Results. Median age of patients with osteoporosis (OP) and patients without OP was 62 [57; 68] and 61 [55; 68] years, respectively ($p>0.05$). UA serum level in patients without OP was more than in persons with OP (278.3 [241.8; 329.1] μmol/l and 259.3 [198.9; 307.7] μmol/l, respectively; $p<0.05$). HU was identified in 4.5% patients with OP and in 17.9% women without OP ($p<0.05$). UA correlated with LS ($r=0.32$, $p<0.001$), FN ($r=0.22$, $p<0.05$), TH ($r=0.27$, $p<0.001$) and duration of postmenopause ($r=0.26$, $p<0.001$). In logistic regression analysis the normal level of UA was a protective factor for OP in postmenopausal women with RA (OR 0.55 95%CI 0.33-0.90, $p=0.017$).
Conclusion. UA serum level in women without OP was higher than in patients with OP ($p<0.05$). HU was 3.9 times more often in persons without OP compared to those with OP. A high level of UA was a protective factor for low BMD and the presence of OP.

P1128

URIC ACID AND APPENDICULAR LEAN MASS IN WOMEN WITH RHEUMATOID ARTHRITIS

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Objective: to assess the frequency of hyperuricemia (HU) and uric acid (UA) association with appendicular lean mass (ALM) in women with rheumatoid arthritis (RA).
Material and methods. 207 women with RA (aged 40-75 years) were enrolled in the study. The level of uric acid (UA) >360 μmol/L was taken as HU. Sarcopenia was diagnosed according to criteria European Working Group on Sarcopenia in Older People (EWGSOP2, 2018). Muscle strength was assessed in all patients with grip strength and 5-chair stand test. Dual-energy X-ray absorptiometry (DXA, Lunar prodigy, GE, USA) was performed to measure the appendicular lean mass. Uric acid level in the blood serum

was determined by spectrophotometry (Cobas C311 analyzer). The study was approved by the local ethics committee.

Results. Mean age of patients with sarcopenia (SP) and patients without SP was 61.1±8.7 and 59.0± 8.5 years, respectively (p>0.05). UA serum level in patients without SP was more than in persons with SP (276.6±79.9 μmol/L and 249.2±75.4 μmol/L, respectively; p=0.034). HU was identified in 4.4% patients with SP and in 11.9% women without SP (p>0.05). UA correlated with ALM (r=0.20, p=0.018) and ALM index (r=0.26, p=0.001), age (r=0.31, p<0.001), body mass index (r=0.35, p<0.001) and duration of post menopause (r=0.22, p=0.008). Univariate linear regression revealed the association among UA with ALM (b=0.22, p<0.001) and ALM index (β=0.24, p<0.001).

Conclusion. UA serum level in women without SP was higher than in patients with SP (p=0.034). HU was 2.7 times more often in persons without SP compared to those with SP. Higher values of muscle mass corresponded to higher UA rates in women with RA.

P1129

ASSOCIATION OF ANTICITRULLINATED ANTIBODIES WITH CHRONIC HELICOBACTER PYLORI INFECTION IN RHEUMATOID ARTHRITIS

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Different mechanisms associated with Helicobacter Pylori (H. pylori) may cause loss of cellular tolerance and promote autoantibody formation in patients with autoimmune rheumatic diseases.

Purpose of the study:

To evaluate the association of chronic H. pylori infection with seropositivity for antibodies to cyclic citrullinated proteins in patients with rheumatoid arthritis (RA).

Materials and Methods.

A clinical and laboratory examination of 92 women with RA (66% seropositive for antibodies to cyclic citrullinated peptide, 58% for antibodies to modified citrullinated vimentin) was performed. Antibodies to cyclic citrullinated peptide (anti-CCP), modified vimentin (anti-MCV), antibodies to H. pylori (anti-H.pylori-IgG) and total antibodies to H. pylori CagA antigen (anti-CagA) were determined by enzyme immunoassay.

Results and Discussion.

Laboratory confirmation of chronic H. pylori infection was obtained in 68.5% of RA patients, with 40% of them testing positive for anti-CagA. The research of laboratory parameters in RA patients with the presence of H. pylori demonstrated an increase in inflammatory markers (ESR, CRP) and studied autoantibodies. When RA patients highly positive for both anti-CCP and anti-MCV were combined, a significant predominance of patients with chronic H. pylori infection was observed in this group (p=0.012). The data of multivariate regression analysis showed a high specific contribution of H.pylori among the factors influencing the levels of anti-CCP (beta=0.25) and anti-MCV (beta=0.23) in the serum of RA patients. Anti-CCP levels in RA patients with anti-CagA(+) were significantly higher not only compared to the group of patients seronegative for anti-H.pylori-IgG, but also compared to patients with anti-H.pylori-IgG but negative for anti-CagA (p<0.001 and p<0.02, respectively).

Conclusions.

Autoreactive B-cells actively producing antibodies to citrullinated proteins in RA may be affected by H. pylori.Additional studies are required to investigate possible clinical and laboratory associations that may influence treatment tactics for anticitrullinated antibody-positive RA patients with positive anti-CagA determinations.

P1130

POSSIBILITY OF USING ANGIOPOIETIN-LIKE PROTEINS TYPES 3 AND 4 AS MARKERS OF INFLAMMATORY PROCESS ACTIVITY IN PSORIATIC ARTHRITIS

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Psoriatic arthritis (PsA) is a chronic immune-mediated inflammatory disease of the bone and joint system that develops in patients with psoriasis.

Research aimed at improving the diagnosis and prognosis of PsA has focused on finding potential biomarkers, among which angiopoietin-like proteins (Angptl) are of definite clinical interest.

Purpose of the study:

To investigate the possibility of using Angptl types 3 and 4 as markers of PsA activity.

Forty-five PsA patients, including 20 (44.4%) men and 25 (55.6%) women, predominantly middle-aged (30 to 59 years) (53.3%), with disease duration of more than 5 years (57.8%) and high (DAS > 3.7) disease activity (66.6%) were involved in the study.

All patients underwent clinical and laboratory examination, which also included determination of serum levels of Angptl types 3 and 4 by enzyme-linked immunoassay.

Results and Discussion.

In PsA patients, the mean Angptl3 level was 1078 ± 348 pg/mL and Angptl4 level was 386 ± 173 pg/mL.

A number of statistically significant (p<0.05) correlations of Angptl levels with a number of clinical and laboratory parameters were found: Angptl3 with triglyceride levels (r=0.31) and ESR (r=0.29); Angptl4 with disease duration (r=0.31) and uric acid levels (r=0.58).

Single-factor analysis of variance showed no association between PsA activity and Angptl levels (Newman-Keuls test; p>0.05 for all types). When performing two-factor analysis of variance with addition to PsA activity (factor 1) of patients with high indicators of inflammatory reaction (increased values of ESR and CRP, n=23) (factor 2), the data on mutual influence of these factors only on Angptl3 content were obtained (p=0.01).
In the group of patients with high level of inflammatory reaction (high levels of COE and CRP) there were significant differences in Angptl3 content between patients with moderate and low activity of PsA (Newman-Keuls test; p=0.008). This fact may be required when differentiating PsA patients according to the degree of disease activity on the background of severe inflammation.
Conclusions.
Further study of the role of Angptl in the pathogenesis of PsA will allow to further investigate the mechanisms of the inflammatory process and may create preconditions for the development of targeted drugs.

P1132

PHYSICAL ACTIVITY AND PERSISTENCE OF SUPRA-THRESHOLD DEPRESSIVE SYMPTOMS IN OLDER ADULTS: A TEN-YEAR COHORT STUDY

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Objective: Few multination-based studies have examined the longitudinal association between PA (physical activity) and persistence of supra-threshold depressive symptoms (SDS) in older people. This cohort study aimed to assess the influence of PA on persistence of SDS.
Materials and methods: Data were obtained from the Population Survey of Health, Ageing and Retirement in Europe (SHARE). The cohort was composed of individuals with SDS at baseline. Depressive symptoms were ascertained using the EURO-D scale, with a value over 4 indicatives of SDS.
Results: The study included 6,631 participants with SDS. After adjusting for nine different covariates at baseline and the changes of PA level during the follow-up period, compared to very low PA, moderately high (OR=0.82; 95%CI: 0.69-0.98; p=0.03), and high (OR=0.80; 95%CI: 0.66-0.95; p=0.01) PA levels were associated with significantly reduced persistence of depressive symptoms. In a propensity score analysis, matching low and high PA level for baseline scores of EURO-D, people with high PA levels reported a lower EURO-D of 0.53 points (p<0.0001).
Conclusions: Among adults with depression, higher levels of PA were associated with a reduced persistence of depression. These real-world data complement evidence on efficacy of exercise as a treatment for depression and can inform clinical guidelines.

P1133

LONG-TERM IMPACT OF PHYSICAL ACTIVITY ON MORTALITY IN ADULTS WITH MULTIMORBIDITY: A 12-YEAR COHORT LONGITUDINAL STUDY FROM THE SURVEY ON HEALTH, AGING, AND RETIREMENT IN EUROPE

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Background: While physical activity (PA) is known to reduce mortality in the general population, this relationship in individuals with multimorbidity (≥ two chronic conditions) is unclear. This longitudinal study aimed to investigate whether there is a long-term association between PA levels and mortality rates over a 12-year period in adults with multimorbidity.
Methods: Data were obtained from eight waves of the Survey of Health, Ageing and Retirement in Europe (SHARE), from 28 European countries. PA levels were self-reported via computer-assisted personal interviews. Mortality during the follow-up period was assessed using data obtained from caregivers through end-of-life interview. Multimorbidity was identified based on the presence of two or more 15 self-reported chronic diseases/conditions. Cox's regression analysis, adjusted for potential confounders, was used to assess the association between PA level and mortality.
Results: The study included 9,216 participants with multimorbidity (mean age 69±10.1 years; 58.7% were women). Among those with multimorbidity, individuals with high PA level were significantly younger, more frequently men, less impaired in activities of daily living, less educated, and less frequently obese than those with very low level of PA (p<0.0001 for all comparisons). Over the 12 years of follow-up, mortality incidence was three times higher in individuals with multimorbidity and very low PA levels than those with multimorbidity and high levels of PA. After adjusting for confounders, the risk of mortality was significantly lower for participants with moderately low PA levels (HR=0.64; 95% CI: 0.59-0.71; p<0.0001), moderately high PA levels (HR=0.53; 95% CI: 0.47-0.60; p<0.0001), and high PA levels (HR=0.49; 95% CI: 0.43-0.55; p<0.0001) compared to those with very low PA levels.
Conclusions: Findings from the present study suggest that people with multimorbidity who had lower levels of PA were three times more likely to die prematurely after 12 years than adults with multimorbidity and higher levels of PA at baseline. These findings underscore the importance of promoting physical activity in adults with multimorbidity to reduce the risk of premature mortality. Future longitudinal research is required to confirm/refute our findings. Further, intervention studies are needed to understand whether increasing levels of physical activity in this population subsequently reduces mortality risk.

P1134

THE CLINICAL EFFICACY OF PLATELET-RICH PLASMA IN ARTHROSCOPIC ROTATOR CUFF REPAIR

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INTRODUCTION

The efficacy of platelet-rich plasma (PRP) in the arthroscopic treatment of rotator cuff injuries has been published in the literature due to the importance of biological mechanisms in tendon healing processes after surgery.

However, the results we found in the literature are very different due to the lack of consensus in the formulation of PRP.

Objetives: Therefore, to minimize these differences, we determined the formulation of PRP according to the DEPA and MARSPILL classifications and the application process to evaluate whether PRP promotes and improves the effects of arthroscopic rotator cuff repair.

MATERIAL AND METHODS

We conducted a retrospective and observational study establishing a series of cases and controls. We obtained a sample of 200 patients treated with arthroscopic technique for full thickness rupture of the SPE tendon by double-row suture. 100 were treated with PRP at the end of surgery (case group) and 100 were not treated with PRP (control group).

We formulated the PRP obtaining a number of platelets between 200-400,000 /mm3, without leukocytes and red blood cells, in a medium with calcium and activated with thrombin.

We placed the PRP at the end of surgery under direct vision by intraosseous infiltration at the level of the humeral footprint, at the tendon-bone contract interface after suturing and in the body of the SPE tendon. All patients were followed up for 5 years.

RESULTS

Treatment with PRP showed a better result in pain control in the short term ($P < 0.005$). However, in the medium and long term these differences are progressively reduced.

In the functional assessment of the shoulder, after applying the Constant scale, statistically significant differences were found in favor of PRP compared to the control treatment.

Finally, during the medium and long term follow-up, the rate of re-tearing in the PRP group was lower than in the control group.

CONCLUSIONS

According to our study, standardization of PRP formulation is necessary for proper reproducibility of the results of different outcomes. The PRP formulation of the present study significantly reduces the rate of postoperative re-tears in the medium and long term. However, it only demonstrated clinically significant effects on the improvement of postoperative pain in the short term.

P1135

IS A COMPREHENSIVE GERIATRIC ASSESSMENT USEFUL IN OLDER PEOPLE WHO ARE DIAGNOSED WITH A HEMATOLOGICAL MALIGNANCY?

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Objective: The number of patients diagnosed with hematological malignancies over the age of 65 is increasing due to the ageing population and the characteristics of hematological diseases. These patients should be assessed using a Comprehensive Geriatric Assessment (CGA) before deciding on the treatment to follow. The aim of this study was to evaluate the effect of CGA, geriatric syndromes and other scales on in-hospital and 1-year follow-up mortality in patients with hematological malignancies who had a pre-treatment consultation with the geriatric department.

Materials and Methods: The study included adults aged 65 years and older with a diagnosis of hematological malignancy. Patients' demographics, comorbidities, geriatric syndromes and treatment modalities were collected. All patients were evaluated by a geriatrician for CGA. The hospitalisation status, the duration of hospitalisation, the in-hospital mortality rate and the one-year follow-up mortality rate were recorded.

Results: In-hospital mortality was 23.8% (n:20) and mortality at 1 year was 33.3% (n:28). In-hospital mortality was associated with frailty (hazard ratio (HR):41.19, 95% confidence interval (CI): [2.74-618.39]; p=0.007) and the presence of sarcopenia risk (HR:0.08, CI:0.01-0.94, p=0.044). Being male, not having received the COVID-19 vaccination, having a higher HOF score and having a lower albumin level were associated with mortality at 1 year follow-up (p=0.016, p=<0.001, p=0.016, respectively).

Conclusions: In older adults, frailty is associated with prolonged hospital stay, adverse drug reactions and increased mortality. Vaccination programmes should be completed in geriatric patients with hematological malignancies, as mortality is higher in patients who have not received the COVID-19 vaccine.

P1136

EVALUATION OF SARCOPENIA IN POSTMENOPAUSAL PATIENTS APPLYING TO THE OUTPATIENT CLINIC

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Objective: Sarcopenia is a multifactorial skeletal muscle disease commonly observed in the geriatric population, influenced by hormonal changes that occur during the postmenopausal period. It negatively affects the functionality of individuals and reduces their quality of life.. This study aims to evaluate the sarcopenia status of postmenopausal women.
Materials and Methods: In our study, a total of 300 postmenopausal women were included. Sarcopenia was defined based on the EWGSOP2 definition. Probable, confirmed, and severe sarcopenia were collectively categorized under the term "sarcopenia,".
Results: Of the evaluated patients, 44.7% (n=134) were found to be sarcopenic. Among the sarcopenic group, 47.8% (n=64) were under the age of 65, while 52.2% (n=70) were geriatrics. The number of chronic diseases, the number of medications used, and the status of polypharmacy were significantly higher in the sarcopenic group (p=0.005, p=0.036, p=0.011). Levels of albumin, testosterone, and IGF-1 were found to be lower in the sarcopenic group (p=0.022, p=0.004, p=0.034). Postmenopausal sarcopenia related to older age (Odds Ratio (OR): 1.07, 95% Confidence Interval (CI): 1.04-1.10 , p<0.001), the presence of osteoporosis (OR: 0.80, 95% CI: 0.39-0.95, p=0.034), and the existence of vasomotor symptoms (OR: 0.43, 95% CI: 0.24-0.76, p=0.004).
Conclusion: Our study highlights the importance of awareness regarding sarcopenia among specialists providing healthcare services to postmenopausal patients. It underscores the significance of initiating preventive and treatment strategies for at-risk patients before they reach the geriatric stage.

P1137

CLINICAL CHARACTERISTIC AND FACTORS ASSOCIATED WITH MAJOR OSTEOPOROTIC FRACTURES IN THE QATARI POPULATION

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Introduction:
Identifying the clinical characteristics and factors associated with fragility fractures is crucial for estimating fracture risk. This aligns with the concept of using the fracture risk assessment tool (FRAX®). Most identified risk factors are derived from cohorts that do not represent Arab ancestry, and it remains uncertain whether these risk factors differ from those in other populations.
Aim: Describe the demographic and clinical characteristics, as well as identify the factors associated with major osteoporotic fractures (MOF) in the Qatari population over a three-year period from 2017 to 2019.
Methods:
Major osteoporotic fractures (MOF), including compression spine fractures, proximal humerus fractures, and distal radius fractures, were identified retrospectively in Qatari individuals aged 40 years and older who underwent X-rays of the humerus, shoulder, wrist, lumbar spine, or thoracic spine at Hamad Medical Corporation (HMC) and Primary Health Care (PHC) facilities in Qatar from January 1, 2017, to December 31, 2019. The electronic medical records (EMR) from both institutions are integrated into a single cloud software system (Cerner®). The EMR of the identified individuals were reviewed by the study investigators to collect data on MOF, demographic information, and clinical characteristics, including age, gender, comorbidities, and medications (such as glucocorticoids, aromatase inhibitors, and anti-epileptic drugs). Patients with fractures resulting from high-energy trauma, as well as those with isolated greater tuberosity or avulsion fractures of the humerus, were excluded from the study. Descriptive analysis and bivariate logistic regression analysis were performed using SPSS.
Results:
A total of 9,617 subjects underwent at least one X-ray of the wrist, shoulder, humerus, lumbar spine, thoracic spine, or thoracolumbar spine during the study period. The mean age of the participants was 57.1 years (±11.9), with females representing 67% of the study population. The average body mass index (BMI) was 33.1 kg/m².
Among the 9,617 individuals, 403 (4.19%) sustained at least one fracture, and 43 subjects experienced multiple fractures during the study period. Of these fractures, 369 (82.7%) were attributed to low-energy trauma. The mean age at the time of experiencing a fragility fracture was 66.8 years (±12.2), with 74% of these cases being female. The most prevalent type of fragility fracture was spinal fractures, totaling 153 cases (41.5%), followed by distal radius fractures at 136 (36.9%) and proximal humerus fractures at 80 (21.7%).
Chronic liver disease was found to have the strongest association with major osteoporotic fractures (MOF), with an odds ratio (OR) of 7.999, followed by epilepsy (OR 3.558) and the use of glucocorticoid medications (OR 3.311). Additional risk factors associated with MOF are summarized in Table 1.
Conclusion:
Most of the identified risk factors for fragility fractures in this Qatari population align with those found in global populations. However, some risk factors did not demonstrate an increased risk of major osteoporotic fractures, which may be attributed to the small number of subjects affected by these conditions.

Table1: demographic and clinical characteristics associated with major osteoporotic fractures including compression spine frac-

tures, proximal humerus fractures, and distal radius fractures (bivariate analysis)

	Fracture n=369	No fracture n=9214	P value	OR (95%CI)
Female	273(74.0%)	6199(67.3%)	0.007	1.383(1.092-1.752)
Age, mean (SD)	66.8(12.2)	56.9 (11.7)	0.000	1.064 (1.055-1.073)
BMI kg/m^2, mean (SD)	30.8 (6.7)	32.5 (76)	0.000	0.958 (0.940-0.976)
Diabetes mellitus, no (%)	178(48.2%)	3207(34.8%)	0.000	1.746(1.417-2.151)
Primary hyperparathyroidism, no (%)	3(0.8%)	42(0.5%)	0.325	1.790(0.552-5.802)
Hyperthyroidism, no (%)	0	7(0.1%)	1.000	---
Chronic kidney disease, no (%)	31(8.4%)	444(4.8%)	0.002	1.812(1.239-2.649)
Chronic liver disease, no (%)	6(1.6%)	19(0.2%)	0.000	7.999(3.176-20.149)
Coronary artery disease, no (%)	11(3%)	79(0.9%)	0.000	2.501(0.319-19.589)
Ischemic stroke, no (%)	8(2.2%)	53(0.6%)	0.000	3.830(1.808-8.116)
Epilepsy, no (%)	14(3.8%)	101(1.1%)	0.000	3.558(2.014-6.285)
Autoimmune rheumatic disease, no (%)	1.(0.3%)	61(0.7%)	0.358	0.408(0.056-2.949)
Parkinson's disease, no (%)	2(0.5%)	21(0.2%)	0.221	2.386(0.557-10.212)
Glucocorticoids, no (%)	28(7.6%)	223(2.4%)	0.000	3.311(2.202-4.976)
Epilepsy medications, no (%)	13(3.5%)	95(1.0%)	0.000	3.505(1.945-6.318)
Aromatase inhibitor, no (%)	1(0.3%)	10(0.1%)	0.351	2.501(0.319-19.589)
Vitamin D level <20 ng/mL	58(15.7%)	1944(21.1%)	0.013	0.697(0.525-0.927)

P1138

SAFETY OF ANTI-OSTEOARTHRITIS MEDICATIONS: OUTCOMES OF A SYSTEMATIC LITERATURE REVIEW OF POST-MARKETING SURVEILLANCE STUDIES

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Objective: To identify all the published post-marketing safety surveillance (PMS) studies on anti-osteoarthritis (OA) medications, and to describe the characteristics and the main findings of these studies.
Methods: This study followed the Cochrane guideline for systematic reviews (SR) of interventions. The Medline, CENTRAL, Scopus, and TOXLINE databases were comprehensively searched from inception to November 2023, to include all PMS studies on any anti-OA medications. The outcomes of the review were any adverse events (AEs) reported in the included studies.
Results: From 16,990 records retrieved from literature search, 59 articles were included. Most studies investigated non-steroidal anti-inflammatory drugs (NSAIDs, 27 studies, 28 reports) and intra-articular hyaluronic acid (IAHA, 16 studies). Symptomatic slow-acting drugs for osteoarthritis (SYSADOAs) were assessed in 7 studies, and corticosteroid injections in 4 studies. Opioids and "herbal mixtures and other compounds" each were investigated respectively in 3 and 2 studies. Most studies were cohort studies (n = 44), others were case reports or case series (n = 12), randomized controlled trials (RCTs, 2 reports of a same trial), or case-control study (n = 1). The most commonly reported AEs with NSAIDs from cohort studies, RCTs, and case-control studies were gastrointestinal (GI) and/or cardiovascular (CV) AEs. Where comparisons between NSAIDs were made, the overall literature shows a better or similar safety profile for celecoxib (at a daily dose of 200 mg) compared to other NSAIDs in regards with the GI, CV, and renal events. Other anti-OA medications with most commonly reported AEs were: IAHA (injection site pain); diacerein (GI AEs and reddish urine); avocado–soybean unsaponifiables (GI AEs); non-pharmaceutical grade glucosamine and chondroitin (allergic reactions, GI disorders); opioids (hip fracture associated with long-term tramadol use among older adults; and GI and nervous system disorders with hydrocodone); corticosteroid injections (increased risk of OA progression); herbal mixtures and other compounds (GI AEs). There were case reports or case series of specific AEs with various anti-OA medications that require further investigations in well designed cohort studies before any definitive conclusions.
Conclusions: This SR of PMS studies confirms previous evidence on the safety of anti-OA medications from meta-analyses of phase 3 RCTs. Beyond the findings reported, the limitations of this research highlight the urgent need of a reporting guideline for PMS studies.

P1139

CLINICAL RESULTS OF MENISCAL REPAIR WITH FIBRIN CLOT AUGMENTATION OF DEGENERATIVE HORIZONTAL TEAR

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Objective: clinical assessment of fibrin clot (FC) augmented meniscal repair in in patients with degenerative medial meniscus tear and concomitant 1st and 2nd K-L knee osteoarthritis. Meniscal preservation surgery is important step to prevent rapid development of knee osteoarthritis. The outcomes of meniscal repair surgery depend on several surgical factors, such as quality of meniscus tissue, type of meniscal tear etc. FC augmentation is inexpensive method which could potentially improve healing of meniscal tear.
Methods: patients with degenerative posterior horn horizontal tear are divided into main group (n_m=21) – meniscal repair with FC augmentation and comparison group (n_c=36) – meniscal repair. During arthroscopy we remove free flaps of meniscus and put the fibrin clot inside the horizontal cleavage meniscal tear. Meniscal repair includes all-inside technique applying circumferential stitches using knee scorion. For FC preparation we use 30-40ml

of patient's blood. During step of dry arthroscopy, we insert FC and tie sutures knots. Patients underwent routine clinical follow up 6 month and 1 year after surgery using Lysholm score, Tegner score, Knee injury and Osteoarthritis Outcome Score (KOOS).
Results: the mean age in patients of the main group was 51.4±4.9, comparison group – 49.8±4.5years (p=0.2). BMI in the main group was 29.6±2.3, comparison group – 28.8±1.9 (p=0.18). In the main group were 14(66.7%) females and 7(33.3%) males and in the comparison group were 25 (69.4%) females and 11 (30.63%) males (p=0.8).
Before surgery, the score on the Lyscholm scale in patients of the main group (n_m=21) was 60.3±4.1, in the comparison group (n_c=36) - 58.4±5.2 points (p=0.1). The score on the Tegner scale before surgery, in patients of the main group (n_m=21) was 4.2±1.1, in the comparison group (n_c=36) – 4.3±0.8 points (p=0.7). Before surgery, the score on the KOOS in patients of the main group (n_m=21) was 63.4±4.1 points, in the comparison group (n_c=36) - 61.7±5.2 points (p=0.1). The score on the Lyscholm scale 6 months post-op in patients of the main group (n_m=21) was 87.2±4.0, in the comparison group (n_c=36) - 89.3±3.7 points (p=0.06). The result on Tegner scale 6 months post-op in patients of the main group (n_m=21) was 5.2±1.0 and in the comparison group (n_c=36) - 5.1±0.8 points (p=0.6). The KOOS 6 months after surgery in patients of the main group (n_m=21) was 89.7±4.7 and in the comparison group (n_c=36) - 92.0±5.1 (p=0.09).There was no difference in clinical results after 6 months of operation.
One year after surgery, the score on the Lyscholm scale in patients of the main group (n_m=21) was 90.3±3.2 , in the comparison group (n_c=36) - 87.6±3.7 points (p=0.02). One year after surgery, the score on the Tegner scale in patients of the main group (n_m=21) was 5.3±1.2 , in the comparison group (n_c=36) - 5.3±0.9 points (p=0.9). One year after surgery, the score on the KOOS in patients of the main group (n_m=21) was 92.2±3.1 , in the comparison group (n_c=36) - 89.8±4.8 points (p=0.02). There was difference in clinical outcomes 1 year post-op follow up. The number of revision surgery during period of follow-up was 3 (14.3%) in main group (n_m=21) and 7(19.4%) in comparison group (n_c=36).
Conclusion: meniscal repairing of degenerative horizontal tear with fibrin clot augmentation shows similar clinical outcomes during 6 months after surgery comparing with meniscal repair alone, but after 1 year after surgery patients with FC augmentation show better clinical result with lower rate of revision surgery. FC augmentation could increase healing rate and decrease level of revision second look arthroscopy.

P1140

OSTEOPOROSIS AND BONE BIOMARKERS

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Introduction: Bone health can be assessed using measurable indicators of bone metabolism known as bone biomarkers.
Methods: We evaluated 20 patients which presented risk factors for osteoporosis by measuring Osteocalcin (OC), Procollagen type 1 N-terminal propeptide (P1NP) and beta-CrossLaps (β-CTx) from venous blood. Patients who presented modifications of these biomarkers were subsequently assessed by dual-energy X-ray absorptiometry (DXA) of the lumbar spine.
Results: Of the 20 evaluated patients, 13 showed changes in the measured bone biomarkers. Further, following the DXA assessment, we found that 7 patients had osteopenia, with the mean T-score being -1.9, presenting a minimum value of -2.3 and a maximum value of -1.1, and 4 patients had osteoporosis, with the mean T-score being -2.7, presenting a minimum value of -2.9 and a maximum of -2.6.
Conclusion: Measurement of such bone biomarkers could represent valid screening methods for osteoporosis.

P1141

COMBINED USE OF LASER THERAPY AND NONSTEROIDAL ANTI-INFLAMMATORY DRUGS IN PAIN MANAGEMENT OF THE SMALL JOINTS OF THE HANDS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Introduction: Rheumatoid arthritis is a chronic inflammatory condition of autoimmune origin that particularly affects the small joints of the hands. The disease causes pain and functional impotence in patients and over time can lead to joint destruction and deformity.
Methods: The aim of the study was to evaluate the effectiveness of using low-level laser therapy (LLLT) and non-steroidal anti-inflammatory drugs (NSAIDs) combined on pain symptomatology control in patients with rheumatoid arthritis.
Results: 14 patients previously diagnosed with rheumatoid arthritis were included, all affected by pain in the small joints of the hands. Pain intensity was assessed using the Visual Analogue Scale (VAS) (0-100 mm), presenting an average of 66.5 mm. The patients underwent physical therapy treatment consisting of LLLT at the radio-ulnar-carpal, metacarpophalangeal and proximal interphalangeal joints, as well as pharmacological treatment with NSAIDs for 10 days. At the end of the treatment period, the patients were re-evaluated, the mean VAS scale presenting the value of 54.3 mm, meaning a decrease of 18.3% from the initial value.
Conclusion: The use of low-level laser therapy and nonsteroidal anti-inflammatory drugs can help control pain symptoms regarding the small joints of the hands in patients with rheumatoid arthritis.

P1142

WEIGHT IMPORTANCE IN OSTEOARTHRITIS OF THE KNEE

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Introduction: Osteoarthritis is the most common arthropathy of the knee joint. Although this was considered a purely degenerative condition, the presence of inflammatory elements have been recently identified in the pathogenesis of the disease. Being a weight bearing joint, obesity is one of the most important risk factors concerning this condition.
Methods: We evaluated 28 patients using musculoskeletal ultrasonography that we divided into 4 groups according to the body mass index (BMI) as follows. The first group was composed of 5 patients with BMI < 24.9 kg/m^2, the second group consisted of 7 patients with 25 kg/m^2 < BMI < 29.9 kg/m^2, the the third group was formed of 10 patients with 30 kg/m^2 < BMI < 34.9 kg/m^2, and the last group had a total of 6 patients with BMI ≥ 35 kg/m^2.
Results: Following the ultrasonographic examination, we found joint changes in 20% of the patients in the first group, in 28.6% of the patients in the second group, in 60% of the patients in the third group and in 83.3% of the patients in the last group.
Conclusion: In a society where the incidence of obesity and metabolic disorders are continuously increasing, these also present a negative impact on osteo-articular health. A higher BMI being associated with an increased risk of developing knee osteoarthritis.

P1143

CHANGES IN BONE MINERAL DENSITY AND THE NEED TO MOBILIZE PATIENTS WITH HEMIPLEGIA AFTER STROKE

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Objective: The relationship between post-stroke immobility and the reduction in bone density presents significant health concerns, particularly regarding fracture risks and subsequent complications in stroke survivors. It was observed that the duration of immobilization plays a central role in changes to bone density.
Methods: A study was conducted involving 25 acute stroke patients. Initially, there were 11 wheelchair-bound patients and 14 ambulatory patients. The assessment method used was bilateral proximal femur measurements through dual-energy X-ray absorptiometry (DXA). The initial assessment took place approximately 8 days post-stroke, and a follow-up evaluation was conducted after one year. Notably, 5 patients who were initially wheelchair-bound achieved walking capability within 4 months.
Results: The one-year bone mineral density (BMD) changes revealed various patterns. Among the permanently wheelchair-bound patients, a reduction of 11% in BMD was observed on the paretic side, while the non-paretic side exhibited a 4% decrease. In the group of patients who regained walking ability, there was a 7% reduction on the paretic side and a 2% reduction on the non-paretic side. For the continuously ambulatory patients, the paretic side showed a 2% reduction, and the non-paretic side showed no significant change.
Conclusion: These findings underscore the importance of early mobilization in post-stroke rehabilitation. The significant bone density loss seen in immobile patients, particularly on the paretic side, indicates that prolonged immobility heightens fracture risk. The research supports the integration of early walking rehabilitation in stroke recovery protocols to help maintain bone mineral density.

P1144

EFFICIENCY OF A PHYSICAL PROGRAM IN THE MOBILITY OF PATIENTS DIAGNOSED WITH POSTMENOPAUSAL OSTEOPOROSIS

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Objective: A first step in trying to improve the functional status of the patient with postmenopausal osteoporosis should be to approach a physical exercise program divided into balance exercise, resistance training and gait rehabilitation exercise. Through the present study we managed to evaluate the effect of a 10-week exercise program on the functional outcomes of patients aiming to improve muscle strength and balance.
Methods: The study includes 72 female patients assessed via Dual-Energy X-ray Absorptiometry (DXA) diagnosed postmenopausal osteoporosis who were randomized into two groups: exercise group and control group. The patients in the exercise group are 35 in number and participated in a 10 week exercise program, which consisted of resistance training, balance exercise and gait training, while patients from control group are 37 in number and had not participated in any exercise program during the intervention period. The examinations performed were as follows: Sit-to-Stand Test (STS), One-Leg Stance Test (OLST), and Timed Up and Go Test (TUG) were assessed at baseline, as well as at 5 and 10 weeks post-treatment.
Results: Statistically significant improvements were observed in all measured parameters in the exercise group after 5 and 10 weeks, respectively. At the end of the study period, a significant difference was observed in the progress of the two groups. The OLST showed a significant change only in the exercise group across all experimental periods. After 5 weeks, there were no statistically significant changes in any of the monitored parameters in the control group. However, after 10 weeks, the exercise group demonstrated improved scores in the Sit-to-Stand (STS) and Timed Up and Go (TUG) tests.
Conclusion: A physical exercise program consisting of balance exercises, resistance training, and gait training can play a crucial role in improving activities of daily living (ADL) and reducing patients' fear of falling.

P1145

METABOLIC DYSFUNCTION-ASSOCIATED FATTY LIVER DISEASE-KEY ELEMENT IN THE PROGRESSION OF OSTEOPOROSIS?

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Key words: metabolic dysfunction-associated fatty liver disease, osteoporosis, hepatokines.

Introduction: Metabolic dysfunction-associated fatty liver disease (MAFLD) is characterized by the accumulation of triglycerides in hepatocytes in the absence of alcohol consumption or other potential causes of hepatotoxicity. Osteoporosis is a disorder of bone metabolism characterized by a reduction in bone density along with changes in bone structure, associated with an increased risk of fractures. Although it is known that patients with MAFLD are at higher risk of developing osteoporosis, the role of hepatokines, proteins synthesized by the hepatocytes with a hormonal role, is incompletely elucidated. Understanding the pathophysiologic mechanisms of hepatokines regarding the development of osteoporosis could provide new options in terms of diagnostic and therapy for future patients.

Materials and Methods: A study was conducted on a total of 15 patients aged 57-68 years diagnosed with MAFLD and Osteoporosis. To compare the results we used a control group of 15 patients aged 55-65 years diagnosed with Osteoporosis, without MAFLD or other chronic liver diseases. The degree of osteoporosis was objectified using DEXA analysis. Hepatokines (Fetuin A, FGF21, LECT2, Hepassocin) were identified in patients serum using Elisa kits. Subsequently, the serum hepatokine levels were correlated with the DEXA score in both groups.

Results: After analyzing the data, we observed that the serum levels of Fetuin A and FGF21 were twice higher in the study group compared to the control group, while the results for LECT2 and Hepassocin were approximately equal in both groups. T-score of DEXA analysis was also higher in the study group compared to the control group (-3.1 versus -2.7).

Conclusions: The results suggest a potential involvement of hepatokines in the pathophysiology of osteoporosis. However, further studies are needed to establish this hypothesis and to assess how the hepatokines influence negatively or positively the progression of bone demineralization.

P1146

OSTEOPOROSIS AND SYSTEMIC INFLAMMATION LEVELS IN CHRONIC PANCREATITIS PATIENTS

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Keywords: chronic pancreatitis, osteoporosis, vitamin D deficiency, systemic inflammation.

Introduction: Chronic pancreatitis (CP) leads to pancreatic exocrine insufficiency which may lead to maldigestion and malnutrition. However, the pathogenesis of low bone mineral density (BMD) has not been characterized. The pathophysiology of secondary osteoporosis in CP is multifactorial, highly related to age and due to exocrine pancreatic insufficiency (EPI) with maldigestion of fat-soluble vitamins including vitamin-D, which has a significant role in the process of bone formation. Therefore, we sought to investigate an association between BMD, systemic inflammation and vitamin D deficiency.

Materials and methods: Twenty-one CP patients (76% male, mean age 51 years (range, 45-72) of whom 76% were smokers) and twenty-one matched controls were recruited from Craiova County Hospital. BMD by dual-energy X-ray absorptiometry at the hip/femoral neck and lumbar spine was measured along with vitamin D (25-hydroxyvitamin D, 25OHD), parathyroid hormone (PTH), interleukin 6 (IL-6), C-reactive protein (CRP), fibrinogen and erythrocyte sedimentation rate (ESR). The data were analyzed focusing particularly on those who experienced exacerbations within the past year. Smoking status was also noted.

Results: 75% of the CP pacients had osteoporosis. Patients had lower 25OHD compared with controls and higher inflammatory markers, including higher Il-6 levels. Using analysis of variance, patients with osteoporosis and CP had higher inflammation (hsCRP), PTH, and IL-6 and lower 25OHD. Moreover, all these patients were smokers.

Conclusion: BMD was abnormal in CP. An association between chronic pancreatitis, low 25-OHD, systematic inflammation (evaluated by hsCRP, fibrinogen, ESR and IL-6) was shown. Those patients with osteoporosis and pancreatitis had the highest systemic inflammation and all of them were smokers. Patients with chronic pancreatitis (CP) may have a higher prevalence of osteoporosis than the general population thereby increasing the risk of bone fracture so should be screened for vitamin D deficiency and corrected with fat soluble vitamin supplementation.

P1148

COMPARISON OF THE COMPREHENSIVE GERIATRIC ASSESSMENT OF OLDER PATIENTS RECEIVING DIFFERENT OSTEOPOROSIS TREATMENT

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Objective: Population ageing is a global phenomenon. The phenomenon of population ageing will lead to an increased proportion of age-associated chronic diseases, including osteoporosis and fractures, and their consequences. The purpose of the present study is to compare the comprehensive geriatric assessment (CGA) of geriatric patients with different osteoporosis treatment choices.

Material and Methods: Osteoporosis was diagnosed by dual energy x-ray absorptiometry. A comprehensive geriatric assessment

included the following: Basic and instrumental activities of daily living, mini nutritional assessment, mini-mental state examination, geriatric depression scale, SARC-F questionnaire, timed up and go test. The diagnosis of probable sarcopenia was made according to the criteria of the European Working Group on Sarcopenia in Older People. Fracture and their localizations were noted.
Results: The study included 125 older patients treated for osteoporosis. Sixty-seven patients were treated with *bisphosphonates,* 40 with denosumab, and 18 with teriparatide. The mean age of the participants was 77,6 ± 8 years; 82% were female. Duration of osteoporosis was higher in those treated with both denosumab and teriparatide than those with *bisphosphonates. Hand grip strength was the highest in the bisphosphonates group. Fracture prevalence was the highest in the teriparatide group. When patients* were categorized into two groups (oral vs. parenteral), the parenteral treatment group had a higher fracture and probable sarcopenia prevalence, and lower calf circumference. Acoording to a comprehensive geriatric assessment parenteral treatment group was more frail than the oral treatment group.
Conclusion: The particular features and potential of the CGA make it useful in managing older patients with osteoporosis. It may give rise to an appropriate, tailored treatment plan for older patients.

P1149

DECISION SUPPORT IN ELECTRONIC HEALTH RECORDS AS TOOL TO IMPROVE CARE FOR WOMEN WITH OSTEOPOROSIS

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Background & Aims: Osteoporosis remains a significant global public health issue, with a growing number of individuals at risk for fractures due to decreased bone density. Despite its high prevalence, osteoporosis is often underdiagnosed and undertreated, largely due to knowledge gaps among healthcare professionals. This abstract explores the role of education in improving the management of osteoporosis across various medical specialties. While specialists such as endocrinologists, rheumatologists, and orthopedists are the primary healthcare providers involved in the diagnosis and treatment of osteoporosis, there is an increasing need for general practitioners (GPs), geriatricians, and internal medicine doctors to have a more in-depth understanding of the disease. This is particularly critical given the aging population and the potential for osteoporosis-related fractures to lead to significant morbidity and mortality. The aim of our study was to explore the quality of osteoporosis care experienced by women in Russia in Fomin Clinic in 12 cities in Russia and how it could be improved with the help of Electronic Health Record with decision support. Methods: 1617 Electronic Health Records of women with osteoporosis before and after the start of the decision support (802 and 815, respectively) were analyzed and rated on a 100-point scale (diagnostics, nutrition, physical activity, treatment recommendations). The decision support system based on Guidelines of Russian Endocrinology Association, Russian Osteoporosis Association, International Osteoporosis Foundation . Results: The average score before using decision support was 43, and after doctors started to use it the average score after 6 months of using became 89. Conclusions: Electronic Health Record with decision support is great tool which improves quality of care for women with osteoporosis and refines the diagnosis and treatment of osteoporosis in different cities in Russia.

P1150

ONLINE COURSE - A NEW OPTION IN IMPROVING OSTEOPOROSIS MANAGEMENT THROUGH DOCTOR EDUCATION

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Background and Aims
Online courses play a critical role in enhancing the quality of diseases management among healthcare professionals, particularly doctors. Given the increasing prevalence of osteoporosis globally, it is essential for clinicians to stay updated on the latest diagnostic methods, treatment options, and management strategies. Online educational platforms provide a flexible, accessible, and cost-effective way for doctors to engage with evidence-based content, case studies, and expert-led discussions. These courses offer opportunities for continuous learning, allowing healthcare providers to improve their knowledge of osteoporosis pathophysiology, risk factors, and the latest pharmacological interventions. Moreover, online courses facilitate the development of practical skills in patient management, empowering doctors to tailor interventions based on individual patient needs. As a result, these educational initiatives contribute significantly to improved patient outcomes, reduced fracture rates, and overall better quality of care in osteoporosis management.
Methods
Online course "Osteoporosis School" by endocrinologist Olga Derevianko based on Guidelines of Russian Association on Osteoporosis and International Osteoporosis Foundation consist of 12 part e-Learning series wich provide health professionals an evidence-based approach to the care of women with osteoporosis in a multidisciplinInary environment. 44 doctors were tested before and after the course.
The questions included the topics of diagnosis, treatment, nutrition and physical activity in osteoporosis.
Results
Doctors improved their results in tests rated on a 100-point scale after the course - from 64 to 96 points.
Conclusions
Online course is a great option in improving osteoporosis management through the training of medical personnel.

P1151

ASSESSMENT OF SERUM OSTEOPONTIN, OSTEOPROTEGERIN AND BONE-SPECIFIC ALP AS MARKERS OF BONE TURNOVER IN PATIENTS WITH DISORDERS OF THYROID FUNCTION IN NIGERIA, SUB-SAHARAN AFRICA

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Background/Objective: Thyroid dysfunctions, the second commonest endocrine disorders worldwide, is a cause of metabolic bone diseases (MBD). These metabolic bone complications are often subtle but manifest as bone pains with increased risk of fractures. The gold standard for diagnosis, Dual Energy X-ray Absorptiometry, is costly, and not readily accessible in this environment. However, bone biomarkers have shown prospects in assessing alterations in bone remodeling, and have not been studied in this environment. Hence, the need for this novel work on the selected cluster of biomarkers in the West African Sub-region. The aim of the study is to evaluate serum levels of bone-specific ALP (BALP), osteopontin (OPN) and osteoprotegerin (OPG) turnover markers in thyroid dysfunctions.
Methodology: This is a cross-sectional study, involving 40 patients with thyroid dysfunctions, aged 20 to 51 years, and 38 matched euthyroid controls. Patients were further stratified into hyperthyroid and hypothyroid groups. BALP, OPN and OPG, alongside the routine bone markers of serum total calcium (TCa) and ionized calcium (ICa) were assayed for all patients and controls, using ELISA technique and ion-selective electrode respectively while inorganic phosphate (IP) was assayed with automated photometry.
Results: The hyperthyroid and hypothyroid groups had significantly increased median serum BALP (30.40 and 26.50) ng/ml and significantly lower median OPG (0.80 and 0.80) ng/ml than the controls (10.81 and 1.30) ng/ml respectively, $p < 0.05$. However, serum OPN in the hyperthyroid and hypothyroid groups were significantly higher and lower respectively, when compared to the controls (11.00 and 2.10 vs 3.70) ng/ml respectively, $p < 0.05$. Both patient groups had significantly higher mean TCa, ICa and IP than the controls (2.49 ± 0.28, 1.27 ± 0.14 and 1.33 ± 0.33) mmol/l and (2.41 ± 0.04, 1.20 ± 0.04 and 1.15 ± 0.16) mmol/l vs (2.27 ± 0.11, 1.17 ± 0.06 and 1.08 ± 0.16) mmol/l respectively, $p < 0.05$.
Conclusion: Patients with thyroid dysfunctions have metabolic imbalance of all studied bone markers, suggesting a higher bone turnover. The routine bone markers will be an invaluable tool for monitoring bone health in them, while the less readily available markers can be introduced as supplementary tools. Moreover, BALP, OPN and OPG were found to be the strongest independent predictors of MBD in thyroid dysfunctions.

P1152

CORRELATION OF BONE TURNOVER MARKERS WITH DURATION OF THYROIDAL ILLNESS IN PATIENTS WITH OVERT HYPERTHYROIDISM IN NIGERIA, SUB-SAHARAN AFRICA

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Background/Objectives: Overt hyperthyroidism has been known to cause profound derangements in the levels of biochemical bone turnover markers in patients not commenced on the appropriate anti-thyroid medications on time, with accompanying attendant metabolic bone complications, as most patients present late in this environment. Little or no work has been done to unravel the impact of this delay in initiating management, especially in Sub-Saharan Africa. This study is therefore set out and aimed at correlating the traditional (conventional) bone turnover markers of total calcium (Tca), ionized calcium (Ica), inorganic phosphate (Ip), and some relatively newer markers with the duration of thyroidal illness in these patients.
Materials/Methods: This is a cross-sectional study, involving 37 patients with a diagnosis of primary hyperthyroidism, aged 20 to 51 years, and 38 matched euthyroid controls. Patients who were on thyroid medications or other drugs that can affect bone turnover, or who have had thyroid surgery or radiotherapy and patients with any other chronic medical conditions that can simultaneously affect bone turnover were all excluded. Self-administered questionnaire was used to obtain their socio-demographic data and medical history, including the duration of their thyroidal illness. Serum samples were assayed in all patients and controls for Osteopontin (OPN), Osteoprotegerin (OPG) and Bone-specific ALP (BALP), using ELISA technique. Tca and Ica were assayed using a direct ISE while Ip was assayed with automated photometry. Spearman Correlation was used to determine the relationship between the markers and the duration of thyroid illness.
Results: Only serum Tca and Ica demonstrated statistically significant positive correlations with the duration of thyroid illness ($r = 0.327$, $p = 0.048$; $r = 0.388$, $p = 0.018$ for Tca and Ica respectively), while Ip, OPN, OPG and BALP showed no statistically significant correlations ($r = -0.102$, $p = 0.550$; $r = 0.033$, $p = 0.845$; $r = -0.176$, $p = 0.296$; $r = -0.057$, $p = 0.740$ respectively).
Conclusion: The traditional bone markers of total calcium and ionized calcium should be routinely done in patients presenting with overt hyperthyroidism, especially in those presenting late, with delayed diagnosis, so as to optimize bone health in them. However, in resource-limited settings, any of these two can suffice in such late-presenters.

P1153

THE IMPORTANCE OF DETERMINING ANTIBODIES TO ELASTIN AND ELASTASE IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS WITH CARDIOVASCULAR SYSTEM PATHOLOGY

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Introduction. Elastin is the main protein component of which elastic fibers are composed. Elastases participate in the exchange of elastin. Damaging factors of various origins cause the production of autoantibodies to its components, leading to inflammation and, subsequently, to tissue destruction. Antibodies to elastin and elastase are predictors of the development of vascular pathology in systemic lupus erythematosus.
Objective. To identify the relationship between the level of antibodies to elastin and elastase in patients with systemic lupus erythematosus and cardiovascular disease
Materials and methods. The serum of 30 donors, 46 with systemic lupus erythematosus SLE, was studied. The diagnosis of SLE was verified using the ACR diagnostic criteria in the 1997 edition. AT to elastin and elastase were determined in the blood serum by the indirect enzyme immunoassay (ELISA) using magnetosorbents (according to the method of I.P. Gontar). The results were expressed in units of optical density (e.o.p.).
Results. When studying the blood serum of healthy individuals, the level of AT to elastin, the upper limit of the norm, was 0.104 e.o.p., and to elastase 113e.o.p. Elevated levels of AT to elastin were detected in 27 (50.8%) patients with SLE, averaging (0.138±0.067) e.o.p., and to elastase (82.6%), on average - (0.154±0.076) e.o.p. Elevated antibody levels were associated with cardiac and vascular lesions. At the first stage of activity of systemic lupus erythematosus, antibodies to elastin were within (0.104 ± 0.010) e.o.p. with cardiac lesions (0.112 ± 0.006) e.o.p.; to elastase - (0.116 ± 0.008), with cardiovascular lesions - (0.124 ± 0.006). In the second degree of activity of antibodies to elastin (0.128±0.006) e.o.p., in case of heart damage, respectively (0.136±0.007) e.o.p.; to elastase (0.148±0.004)e.o.p, in case of cardiovascular damage – (0.157±0.005)e.o.p. In patients with the third degree of SLE activity, AT to elastin (0.154±0.004) e.o.p., in case of cardiovascular damage – (0.168±0.005)e.o.p.; to elastase (0.172±0.008)e.o.p, in case of cardiovascular damage – (0.185±0.008)e.o.p.
Conclusions. The conducted studies revealed a relationship between the level of AT to elastin, elastase and cardiovascular damage. This fact indicates that antibodies to elastin and elastase are specific predictors of the development of vascular pathology in SLE.

P1154

DIAGNOSTIC AND PATHOGENETIC SIGNIFICANCE OF AUTOANTIBODIES TO FIBRONECTIN IN THE OCCURRENCE OF AUTOIMMUNE INFLAMMATION IN PATIENTS WITH RHEUMATIC DISEASES

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Introduction. Fibronectin (FN) is known for its polyvalent properties, due to the presence in its molecule of specialized regions – domains that have a high affinity for collagen, fibrin, bacterial walls, etc. The formation of antibodies to FN, as studies show, plays an important role in the pathogenesis of rheumatic diseases, since it can be the cause of the weakening of a number of important functions of this glycoprotein.
Objective. Study of the clinical and pathogenetic role of antibodies to fibronectin in patients with systemic lupus erythematosus and systemic scleroderma using antigen immobilization technology on polyacrylamide granules with magnetic properties.
Materials and methods. The serum of 30 healthy individuals, 53 SLE patients and 34 patients with SSD was studied. In the group of SLE patients, 10 people (19%) had stage I disease activity, 32 (60%) – II and 11 (21%) – the maximum stage of pathological process activity. The SLAM and SLEDAL indices were also calculated. Among patients with SSD, 18 people (53%) had stage I disease activity, and 16 (47%) had stage II. According to the nature of the disease course, patients were distributed as follows: with SSD, 22 people (65%) had a subacute course and 12 people (35%) had a chronic course of the disease. With SLE, the acute course of the disease was observed in 4 patients (7%), subacute - in 37% of patients (70%) and chronic - in 12 (23%). Antibodies to FN were determined by the enzyme immunoassay using magnetosorbents (IGAP) (modified by I.P. Gontar)
Results. When studying the blood serum of healthy individuals, AT to FN was 0.03±0.01 e.o.p. Elevated levels of AT to FN were detected in 20 (41%) patients with SLE and in 11 (32%) patients with SSD. In patients with SLE, the level of AT to FN reliably depended on the activity of the pathological process. In case of damage to the cardiovascular and musculoskeletal systems, the percentage of detection of AT to FN in SLE increased to 68 and 74%, respectively. In SSD, high titers of AT to FN were associated with damage to the cardiovascular ($p<0.05$) and nervous systems ($p<0.001$). Most likely, an increase in the concentration of serum AT to FN in SLE is a consequence of generalized hyperproduction of antibodies, the intensity of which increases proportionally to the degree of disease activity. Violation of the antithrombotic functions of FN as a result of blockade of the active centers of the molecule by antibodies can contribute to the development and progression

of vascular pathology in SSD and SLE (coronaryitis and cerebral vasculitis).
Conclusions. Thus, the determination of antibodies to FN using IGAP allows us to expand our existing understanding of the pathogenesis of SLE and SSD and can be used to improve the immunodiagnostics of these diseases.

P1155

THE ROLE OF AUTOANTIBODIES TO TYPE II COLLAGEN AND FIBRONECTIN IN THE DESTRUCTION OF CONNECTIVE TISSUE IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Introduction. The basis of the pathogenesis of rheumatoid arthritis (RA) is currently considered to be the development of immunological reactions to components of connective tissue, mainly to its main protein – collagen. The leading role in this is given to type II collagen, which is predominantly found in articular cartilage. Fibronectin (FN) is a secretory product of connective tissue cells. Various etiologic factors induce the production of autoantibodies to the main components of connective tissue, leading to a pronounced inflammatory reaction with subsequent destruction of connective tissue.
Objective. To identify the relationship between the level of antibodies to FN, KII type and the destruction of connective tissue in patients with rheumatoid arthritis
Materials and methods**.** Serum from 30 donors and 120 RA patients was studied. Minimal activity I was observed in 16 people (13.3%), moderate II – in 68 (56.6%), and maximum – in 46 (38.3%) patients. The articular form of the disease was diagnosed in 71 (59.1%) patients, the articular-visceral form – in 49 (40.8%). Antibodies to type II collagen (AT to KII) and FN were determined by the enzyme immunoassay method modified by I.P. Gontar. The results obtained were expressed in units of optical density (e.o.p.).
Results. Elevated levels of AT to FN were detected in 53.6% of RA patients, and AT to KII were observed in 86% of patients. Moreover, the studied indicator correlated with the degree of disease activity ($p<0.01$). Obviously, this allows us to consider AT to KII and FN as a serological marker of RA. When determining AT to KII in groups with articular and articular-visceral forms, there were no fundamental differences, which indicates a specific dependence of the content of these antibodies on damage to cartilage tissue and their leading role in the pathogenesis of RA. A relationship was established between the level of antibodies to FN and the clinical features of the disease. The maximum values of the studied antibodies were detected in patients with Raynaud's syndrome ($p<0.05$) and RES damage ($p<0.01$).
Conclusions. Determination of antibodies to articular collagen type II and FN may indicate the degree of destructive process of connective tissue in RA.

P1156

PARTICULARITIES OF UVEITIS IN SPONDYLOARTHRITIS

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Introduction:
Uveitis is a frequent extra-articular manifestation in patients with spondyloarthritis. This study aims to assess the epidemiological, clinical and therapeutic features of uveitis in spondyloarthritis.
Materials and methods:
This is a monocentric, retrospective study carried out in a rheumatology department, including the cases of patients followed up for spondyloarthritis diagnosed according to ASAS 2009 criteria and who presented with uveitis, collected over a 15-year period.
Results :
Of the 56 patients included in the study, 12 developed uveitis during follow-up, representing a prevalence of 21.4%. The mean age of these patients was 44.41 years [31-54]. The sex ratio F/H was 0.33. Uveitis was revelatory of the diagnosis in 4 cases (33.3%). Uveitis was unilateral in 7 cases, bilateral in 2 and flip-flop in 3. It was anterior in 12 cases (%) and intermediate in only 1. Synechiae were present in 5 cases (%). No patient developed retinal vasculitis. The average number of relapses was 2 per year. Local corticosteroid therapy was prescribed in all cases, with recourse to general corticosteroid therapy in 4 cases. Immunosuppressants were prescribed in 3 cases.
Conclusion:
Ocular involvement is frequent in spondyloarthritis, hence the importance of regular monitoring to ensure early and appropriate management and improve the visual prognosis of these patients.

P1157

PREVALENCE OF OSTEOPOROSIS IN HEALTHCARE WORKERS

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Introduction:
Osteoporosis is a diffuse skeletal disease characterized by a decrease in bone strength, leading to an increased risk of fracture. Because of the physical nature of their work and their often long working hours, healthcare workers can be particularly vulnerable to this pathology.
The aim of this study was to investigate the prevalence of osteoporosis in nursing staff and to analyze the risk factors.
Patients and methods:
We conducted a cross-sectional study among healthcare profes-

sionals working in the Farhat Hached Hospital in Sousse. Bone mineral density (BMD) was measured by X-ray absorptiometry (DXA) at the lumbar spine and hip.

Results:

Eighty participants were included, with a clear female predominance (95.3%). Mean age was 61 years [38-85]. Among the participants, 87.2% were postmenopausal at a mean age of 48.2 years [40-56]. A hip fracture in one of the parents was observed in 23.3% of cases. Osteoporosis was observed in 22.1% of cases at lumbar level and in 18.6% of cases at the hip, with a mean T-score of -3.11DS and -2.88DS respectively. 41.9% of participants had lumbar osteopenia and 39.5% had femoral osteopenia. Risk factors significantly associated with osteoporosis were advanced age (p=0.04), early menopause (p=0.008) and a history of hip fracture in one of the parents (p=0.02).

Conclusion:

This study highlights a notable prevalence of osteoporosis among healthcare personnel, particularly among women and elderly individuals. These results underline the importance of targeted preventive and awareness-raising measures to promote bone health among this population exposed to specific professional risks.

P1158

OSTEOPOROSIS IN SYSTEMIC LUPUS ERYTHEMATOSUS : PREVALENCE AND ASSOCIATED FACTORS

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Introduction:

Systemic lupus erythematosus (SLE) is a chronic auto immune disease that can affect several organs and systems, including the musculoskeletal system, with consequences for bone health.

Our aim was to investigate the prevalence of bone density abnormalities in lupus patients and to identify associated risk factors.

Patients and methods:

This was a retrospective study carried out in the Rheumatology Department of Sousse over a period of 20 years , involving 46 cases of lupus patients followed up,meeting ACR criteria and who were screened by bone densitometry(DXA)

Results:

There were 38 women and 8 men. Duration of disease progression was 68.64 [6-192].High-dose corticosteroid therapy was prescribed in 36 patients. Osteoporosis was noted in 14 patients in the lumbar spine (10cases) and femoral neck (4cases). Seven patients had osteopenia and 25 had normal bone mineral density (BMD). Vertebral fracture was reported in 4 patients with osteoporosis. The mean age was 39 years in the osteoporosis group, 50 in the osteopenia group and 34 in the normal BMD group. The analytical study of factors associated with osteoporosis showed a higher frequency in patients with a longer duration of disease progression(p=0.03) and in those with a lower BMI (p=0.04).

On the other hand, we did not find a significant association between the existence of osteoporosis and age,the use of high dose corticosteroids, the presence of a biological inflammatory syndrome and the frequency of cardiovascular risk factors.

Conclusion:

Patients with SLE are often confronted with alterations in their bone status that can lead to bone fragility and an increased risk of fractures. Associated factors include low BMI and the duration of the disease.

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LOOP DIURETICS IN CHRONIC HEART FAILURE THERAPY AND FUNCTIONAL DISORDERS OF BONE TISSUE

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In the most countries the prevalence of chronic heart failure (CHF) among the adult population in general 1.5–5.5%. According to epidemiological data, almost 75–80% of all cases of CHF are caused by coronary heart disease (CHD) or arterial hypertension (AH) by itself or in combination. The prognosis of survival for patients with CHF worsens with the progression of this disease, which prompts treatment of CHF, including diuretics, as early as possible. A connection between cardiovascular diseases and a high risk of bone loss may be presented 2 ways. First, it was established that reduced bone mineral density (BMD) was a predictor of CHF. Also, a relationship between the use of loop diuretics, BMD decrease and the risk of fractures was shown in many studies. However, the task of controlling bone tissue status for patients with CHF remains unresolved.

The purpose of the study was to assess the effect of loop diuretic therapy on phosphorus-calcium metabolism in patients with chronic heart failure and moderately reduced ejection fraction.

Materials and Methods. The research has a prospective nature. On the basis of the Odesa Regional Clinical Medical Centre, a clinical and laboratory examination of 109 male patients aged from 65 to 74 years (mean age – 67.4±2.7) was carried out. Among them, 86 patients had CHF stage "C: with a moderately reduced left ventricular EF functional class III according to NYHA, which occurred against the background of CHD and arterial hypertension (AH) and were divided into groups: the 1st group included 41 patients who received constant basic therapy for CHF; The 2nd group consisted of 45 patients who were on constant basic CHF therapy and used loop diuretics (torasemide 10–20 mg/day or furosemide 40–80 mg/day) during the last year. The control group or group III consisted of 23 patients who had no complaints or clinical abnormalities from the cardiovascular and bone systems. All patients underwent a complete clinical examination, objective examination according to generally accepted methods. Phosphorus-calcium exchange indices were assessed by determining total and ionized calcium, phosphorus, parathyroid hormone (PTH), 25-hydroxyvitamin D (25(OH)D) in blood serum.

Results of the study and their discussion. The mean age of patients in the 1st group was 68.7±2.8 years, in the 2nd group – 68.1±2.1, and in the 3rd group – 67.9±2.4 years. Therefore, according to age indices, all groups of examined men were ho-

mogeneous (p>0.05). Based on the results of the analysis of risk factors for the development and progression of CHF, the following factors were identified in the study groups: AH, CHD, obesity, excess body weight, dyslipidemia, permanent form of arterial fibrillation, impaired glucose tolerance.

The study of indices of phosphorus-calcium metabolism did not reveal a significant (p>0.05) increase in the level of total and ionized calcium in the blood serum of patients with hypertension and coronary heart disease complicated by CHF. The content of total calcium in the 1st group was 2.26±0.03 mmol/l (p>0.05), in the 2nd group – 2.24±0.02 mmol/l (p>0.05) , in the 3rd group – 2.29±0.02 mmol/l. Ionized calcium in the 1st group – 1.23±0.02 mmol/l (p>0.05), in the 2nd group – 1.22±0.01 mmol/l (p>0.05), in the 3rd group – 1.25±0.02 mmol/l. Phosphorus level in patients of the 1st and the 2nd groups was significantly reduced – 0.84±0.01 mmol/l (p>0.05) and 0.96±0.02 mmol/l (p>0.05), respectively, compared to the 3rd group – 1.12±0.02 mmol/l. A significant difference was found between the level of phosphorus in the 1st and the 2nd groups (p<0.05), a lower level of phosphorus was recorded in men of the 1st group.

Deficiency of vitamin D and IVD, a significantly higher (p<0.05) level of PTH and a low level of phosphorus demonstrate the presence of disturbances in phosphorus-calcium metabolism and indicate the presence of an imbalance in the system of hormonal regulation of calcium homeostasis in patients with AH and CHD complicated by CHF.

Conclusion. Basic therapy of chronic heart failure in combination with loop diuretics for a long time has a negative effect on the state of mineral density of bone tissue, indices of bone remodeling and phosphoruscalcium metabolism. Vitamin D deficiency is an independent risk factor for the severe course of chronic heart failure and requires timely diagnosis and correction.

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A DUAL CHALLENGE: THE IMPACT OF FIBROMYALGIA ON THE MANAGEMENT OF RHEUMATOID ARTHRITIS

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Introduction

Rheumatoid arthritis (RA) is chronic inflammatory arthritis leading to progressive joint destruction and significant functional disability. It can coexist with fibromyalgia, exacerbating the disease's progression and further diminishing the patients' quality of life. The objective of this study is to determine the prevalence of fibromyalgia in RA patients and identify associated factors.

Methods

This cross-sectional study included patients with RA diagnosed according to the ACR/EULAR 2010 criteria. Clinical characteristics, the Disease Activity Score 28 (DAS28), and the Health Assessment Questionnaire (HAQ) were assessed. Fibromyalgia screening was conducted using the FiRST questionnaire, with a score of ≥5/6 considered as the threshold. The Widespread Pain Index (WPI), Symptom Severity Scale (SSS), and the total score were also calculated, with a total score ≥13 confirming the diagnosis of fibromyalgia.

Results

A total of 46 patients were included, with a sex ratio of 0.17, a mean age of 52 ± 3.5 years, and an average disease duration of 13.7 ± 1.86 years. RA was seropositive in 73.9% of cases and erosive in 97.8%. Treatments included methotrexate (73.9%), oral corticosteroids (76.1%), and biologics (60.9%). Additionally, 95.7% of patients were using analgesics. The average DAS28 score was 4 ± 0.4, and the average HAQ score was 1.6 ± 0.2.

The prevalence of fibromyalgia, as assessed by the FiRST questionnaire, was 82.6%, with an average FiRST score of 5.8 ± 0.9. The mean WPI was 16.3 ± 1, the mean SSS was 6 ± 0.6, and the average total score was 21.5 ± 1. Among the patients, 78.3% had a total score ≥13, confirming the diagnosis of fibromyalgia.

In our cohort, fibromyalgia was significantly associated with nocturnal awakenings ($p < 0.001$), Visual Analog Scale (VAS) ($p = 0.017$), and disease activity ($p < 0.001$). The WPI score correlated with age ($p = 0.001$, $r = 0.5$) and HAQ ($p = 0.018$, $r = 0.38$). The SSS score correlated with DAS28 ($p < 0.001$, $r = 0.6$) and HAQ ($p = 0.004$, $r = 0.54$).

Conclusion

This study highlights the high prevalence of fibromyalgia in RA patients, with significant impacts on disease progression and quality of life. Fibromyalgia is associated with disease activity and severity, underscoring the importance of systematic screening for comprehensive and tailored management.

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COMPARATIVE DETECTION OF VERTEBRAL FRACTURES IN WOMEN AT RISK FOR OSTEOPOROSIS: INSIGHTS FROM VERTEBRAL FRACTURE ASSESSMENT AND RADIOGRAPHY

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Background

Vertebral fractures (VFs) are prevalent but often underdiagnosed complications of osteoporosis due to their asymptomatic presentation or misinterpretation as benign back pain. While standard radiography remains the reference standard for VF detection, Vertebral Fracture Assessment (VFA) performed via dual-energy X-ray absorptiometry (DXA) offers a low-radiation alternative integrated into routine bone densitometry. This study compares the sensitivity of VFA and standard radiography in identifying VFs in women at risk for osteoporosis.

Methods

A cross-sectional study was conducted involving 37 women with risk factors for osteoporosis. Clinical data were collected, and bone mineral density (BMD) was measured at the lumbar spine and femoral neck using DXA. VFs were detected using both standard radiography and VFA, and fractures were classified by anatomical location (thoracic or lumbar spine). Detection perfor-

mance of the two imaging modalities was compared.

Results

The mean age of participants was 59.8 ± 9.9 years, with 86.5% reporting back pain. A history of prior fractures was noted in 32.4% of the cohort. The mean T-score was −2.1 ± 1.1 at the spine and −1.2 ± 0.8 at the femoral neck. Osteoporosis was diagnosed in 43% of patients (43% postmenopausal osteoporosis, 5.4% corticosteroid-induced osteoporosis), while 18.9% had normal BMD. Indications for performing VFA included age >60 years and T-score < −2 (13.5%), history of prior VFs (32.4%), height loss ≥4 cm (5.4%), and long-term corticosteroid use (37%). Standard radiography identified VFs in 35.1% of patients, with a total of 25 fractures detected: 18.9% had a single VF, 8.1% had two VFs, and 8.1% had three or more VFs. The fractures were predominantly located in the thoracic spine (27%) and lumbar spine (16.2%). In contrast, VFA detected VFs in 51.3% of patients, identifying a total of 37 fractures: 21.6% had a single VF, 18.9% had two VFs, and 10.8% had three or more VFs. VFA demonstrated greater sensitivity in detecting thoracic fractures (45.6%) compared to lumbar fractures (13.5%). Overall, VFA was significantly more sensitive than radiography in identifying VFs (p = 0.004), particularly thoracic fractures (p = 0.004), with no significant difference in detection rates for lumbar fractures (p = 1).

Conclusion

VFA demonstrates superior sensitivity compared to radiography in detecting vertebral fractures, particularly in the thoracic spine. Its integration into DXA offers a low-radiation, efficient, and accessible diagnostic approach for osteoporosis-related fracture detection. Combining VFA with radiography may enhance diagnostic accuracy, leading to improved fracture detection, better management of osteoporosis, and ultimately better patient outcomes.

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OBESITY AND RHEUMATOID ARTHRITIS: UNRAVELING THE COMPLEX CONNECTION

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Introduction

Obesity is a condition characterized by an excess of body fat. Overweight and obesity in the context of chronic inflammatory arthritis are associated with increased morbidity and mortality. The aim of this study was to evaluate the impact of overweight and obesity on the presentation and activity of rheumatoid arthritis (RA).

Patients and Methods

This was a retrospective comparative study including patients with RA who were followed over a three-year period (2019-2022). Clinical, biological, and radiological data, as well as body mass index (BMI) and disease activity scores (DAS28 VS and DAS28 CRP), were collected and analyzed.

Results

Ninety-five patients were included in the study. The mean age of the patients was 55.14 ± 13.4 years, with a sex ratio of 0.21. The mean disease duration of RA was 42 months (range 1 month to 240 months). Of the patients, 2.1% were underweight (BMI < 19 kg/m²), 38.8% had a normal weight (BMI between 19 and 25 kg/m²), 43.2% were overweight (BMI between 25 and 30 kg/m²), 13.7% had moderate obesity (BMI between 30 and 35 kg/m²), and 2.1% had severe obesity (BMI > 35 kg/m²).

Overweight was associated with a higher incidence of extra-articular manifestations (p = 0.011), particularly dry eye syndrome (p = 0.038), and more severe disease activity, as defined by a DAS28 CRP > 5.1 (p = 0.022). Obesity in RA patients was associated with hypertension (p = 0.037), hallux valgus deformity (p = 0.004), and positive antinuclear antibody (p = 0.03). Furthermore, obese patients had a higher prevalence of osteoporosis compared to non-obese patients (p = 0.008).

Conclusion

Our study revealed a notable prevalence of overweight and obesity among RA patients. These conditions were associated with increased comorbidities, heightened extra-articular manifestations, and exacerbated disease activity. This highlights the importance of adequate management of overweight and obesity in patients with RA.

P1163

WEIGHT MATTERS: THE IMPACT OF BODY MASS ON FALL RISK AND FEAR OF FALLING IN RHEUMATOID ARTHRITIS PATIENTS

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Introduction

Falls represent a major health concern in patients with rheumatoid arthritis (RA) due to joint involvement, decreased mobility, and postural instability. This study aims to assess the association between body mass index (BMI) and fall risk in RA patients.

Material and Methods

This study included RA patients, classified into three groups based on BMI: normal weight, overweight, and obese. Fall risk was assessed using the Sternal Push Test (SPT) and Walking and Talking Test (WTT). The Tinetti Test (TT) evaluated gait and balance, with scores <23 indicating a high fall risk. The Falls Efficacy Scale International (FES-I) assessed fear of falling, with with scores greater than 10 indicating heightened concern.

Results

The cohort included 51 patients with a mean age of 54 ± 2.7 years and an average BMI of 28.2 ± 1.2 kg/m². Among them, 37.3% were overweight, 31.4% were obese, and 31.3% had normal weight. In the obese group (n = 16), 56.3% reported a history of fractures, and 62.5% experienced at least one fall in the preceding year. Notable comorbid risk factors in this group included psychological disorders (43.8%), antihypertensive therapy (12.5%), urinary

dysfunction (68.8%), spinal osteoarthritis (93.8%), knee joint involvement (93.8%), and foot deformities (68.8%). A positive SPT was observed in 43.8%, and 25% demonstrated a positive WTT. The mean TT score was 24.7 ± 2.5, with 31.3% scoring below 23, indicating high fall risk. The mean FES-I score was 12.7 ± 4, with 68.8% reporting significant fear of falling.

In the overweight group (n = 19), 26.3% had a history of fractures, and 68.4% reported at least one fall in the past year. Common risk factors included psychological disorders (36.6%), antihypertensive therapy (31.6%), urinary dysfunction (68.4%), spinal osteoarthritis (89.5%), knee involvement (78.9%), and foot deformities (63.2%). Positive SPT and WTT findings were noted in 42% and 36.8% of patients, respectively. The mean TT score was 24.7 ± 2.5, with 52.6% scoring below 23. The average FES-I score was 12.7 ± 4, with 78.9% expressing significant fear of falling.

Patients in the overweight and obese categories had a significantly higher fall incidence compared to those with normal weight ($p < 0.001$), with 92% of patients prone to falls being either overweight or obese. Furthermore, these patients exhibited a greater prevalence of urinary dysfunction ($p = 0.036$), knee joint involvement ($p = 0.033$), fractures ($p = 0.04$), and fear of falling ($p = 0.001$). BMI was negatively correlated with TT scores ($r = -0.575$, $p = 0.01$) and positively correlated with FES-I scores ($r = 0.416$, $p = 0.008$) and the number of fractures ($r = 0.377$, $p = 0.02$).

Conclusion

Obese and overweight RA patients exhibit a significantly increased risk of falls, fractures, gait and balance impairment, and heightened fear of falling. Given the elevated risk, weight management should be prioritized in this population to mitigate fall risk, reduce fracture incidence, and enhance overall quality of life.

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EFFICACY OF MOOD FACTOR IN PATIENTS WITH COMPLEX REGIONAL PAIN SYNDROME

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Objective:

Complex Regional Pain Syndrome is a condition characterized by pain and dysfunction in the somatomotor, somatosensory, and sympathetic nervous systems (1). There are physicological sympthoms such as fear, anxiety, anger, depression and failure to cope nearby functional limitation and pain (2,3). It raises the question of whether patients' anxiety during the outpatient clinic causes these symptoms, or whether patients with anxiety and depression are more prone to this pathology (4-7). This study aimed to explore efficacy of mood factor in patients with Complex Regional Pain Syndrome.

Materials and methods:

The study included 131 patients with a history of trauma or operation. 70 patients diagnosed with Complex Regional Pain Syndrome and 61 patients were revealed in control group. Demographic information was recorded and participants were evaluated with, Visual Analog score, Beck Anxiety Inventory, Beck Depression Inventory and Short Form-36.

Results:

There were 62 male and 69 female patients and the avarage age of patients was 44,53± 14,17. There was no significant difference between demographic properties. There was no significant difference in term of anxiety (p=0,582) and depression scores (p=0,258) between patients with Complex Regional Pain Syndrome and control group. There were significantly higher Visual Analog Scores (p=0,001) in patients with Complex Regional Pain Syndrome. The subscores of Short form-36; pain level (p=0,033), social function (p=0,041)and physical role (p=0,001) were worse in in patients with Complex Regional Pain Syndrome. There was no difference in other subscores of Short form-36 between two groups.

Conclusion:

This findings suggest that basic mood of the patient does not seem to play role in Complex Regional Pain Syndrome to occure. These mood changes may be only result of the dissease as pain level, social function and physical role were determined worse in theese patients. There is a need for further studies that includes larger sample group, detailed mood and charactheristic tests.

Key Words: anxiety, complex regional pain syndrome, depression, mood, reflex sympathic dystrofia

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EVALUATION OF THE IMPACT OF EMOTIONAL FACTORS ON OBESITY AND GENERAL WELL-BEING

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Objective:
Obesity is a health problem that is often present and coexists with anxiety and can be found with psychological eating styles such as emotional eating, addictive eating state and overeating. Emotions and eating are both a natural and recurring part of our daily lives. Research suggests that emotional factors influence the quantity and quality of food eaten, and food intake can have emotional consequences. Food intake is related to both energy balance regulation and reward and taste effects. The aim of this study was to evaluate the impact of emotional factors on obesity and general well-being.

Materials and methods:
It was a cross-sectional study. The patients revealed as overweighted and healty volunters who attended to Baskent University were included in the study. Patients younger than 18 and older than 65 years, who have uncontrolled systemic disease and pregnants were excluded from the study. Demographic information was recorded and participants were evaluated with Obesity-related well-being questionnare and Emotional eater questionnare.

Results:
Totally 203 Patients were analyzed. There were 77 male and 126 female patients and the avarage age of patients was 38,60± 12,77. There was no significant difference between demographic properties. It was detected that females and younger volunteers have lower body mass index ($p<0.05$). Obese volunteers have higher Obesity-related well-being questionnare scores including higher socialsubdimesion ($p<0.05$). Additionally, normal weighted volunteers hava lower Emotional eater questionnare scores ($p<0.05$).

Conclusion:
This findings suggest that obese people have had much more emotional eating behaviour. Although they have been overweighted, their well-being and sociality scores were much more higher. Further studies are needed to shed light on the issue.

Key Words: Emotional, emotional eater, obesity, well-being

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THE PROGNOSIS AND EARLY DIAGNOSTICS OF THE POSTMENOPAUSAL OSTEOPOROSIS

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The aim of the work is to optimize the early diagnostics of the postmenopausal (PM) osteoporosis (OP). **Materials and methods.** 125 postmenopausal women in the age group of 51 to 60 years old (56,2 ± 0,9) have been examined. The examinations such as clinical examination, colposcopy, the measurement of the pH of the vaginal content (Lashema, Czech Republic), ultrasound densitometry (Aloka OS - 100) have been made. The estradiol (E) in the blood and the biochemical markers of the bone resorption – BCrossLaps(CTX) («Elecsys» 2010) have been determined. **Results and discussion**. It has been revealed that 86.8% of postmenopausal women with urogenital disorders had signs of atrophy of the mucous membrane of vagina, 41% of patients had urogenital disorders combined with complaints on the bone system, 77.5% of women with urogenital disorders had the accelerated resorption of bone tissue. An inverse correlation between CTX and concentration of E in the blood (r = - 0482; p <0001), St ind. and the duration of the menopause (r = - 0997; p <0001), between St ind. and appearance of the urogenital disorders (r = - 0574, p <0.01) has been found. **Conclusions.** Women with the clinical appearances of hypoestrogenia in the urogenital system and with urogenital disorders are in a high risk group for the development of PM OP and its complications. The urogenital disorders caused by the hypofunction of ovaries are the predictor of the development of abnormalities of bone remodeling in the menopause. The prediction and early di-

agnosis of PM OP will give the possibility to appoint a timely therapy in the preclinical stage of the disease and thereby improve the quality of bone tissue, reduce the risk of the fractures and improve the quality of life.

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ALENDRONIC ACID IN THE TREATMENT OF OSTEOPOROSIS IN YOUNG MAN WITH MULTIPLE FRACTURES CAUSED BY CUSHING'S DISEASE: CASE REPORT

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Cushing's disease is an endocrine disorder that results from excess cortisol production. Cortisol disrupts bone metabolism, leading to decreasing bone density (osteoporosis) and an increasing risk of fractures. Osteoporotic fractures are widely recognized as a common and important cause of disability and death in postmenopausal women, but are relatively poorly understood in men. Alendronate significantly increases bone mineral density and reduces the incidence of osteoporotic fractures, including vertebral and hip fractures, in postmenopausal women, but there are few data on its usage in men.

Case report: A 25-year-old patient complains of pain in the spine and sacral region. Considers himself ill for about 1.5 years, when he took notice of weight gain, red painful striae on the thighs, and high blood pressure. At the same time, he noted an increase in pain in the spine and sacral region. Examination revealed fractures of the Th4, Th5, Th6, Th7 vertebrae, sacral and pubic bones. The growth of cortisol's level in the urine (997 mcg/24) and blood serum (42.4 mcg/dl), a decrease in vitamin D (17.19 ng/ml) were noted. The diagnosis of pituitary adenoma was confirmed by MRI. According to X-ray densitometry, the bone mineral density (BMD) in the lumbar spine was -3.3 SD (according to the T-score). After neurosurgical intervention, the patient was prescribed alendronic acid 70 mg once a week, vitamin D 4000 IU per day. After 6 months of treatment, normalization of vitamin D levels was noted, BMD improved -2.1 SD (according to the T-score). After another 6 months, bone mineral density reached -1 SD (according to the T- score).

Conclusion: Alendronate increased bone mineral density, which indicates its effectiveness in the treatment of men with osteoporosis.

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MONOCLONAL GAMMOPATHY IN CHRONIC INFLAMMATORY ARTHRITIS: EXPLORING CLINICAL, BIOLOGICAL PROFILES, AND DISEASE PROGRESSION

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Introduction

Monoclonal gammopathies are biological abnormalities characterized by the presence of a monoclonal immunoglobulin produced by clonal plasma cells. These anomalies can arise in association with chronic inflammatory conditions, such as spondyloarthritis (SpA) and rheumatoid arthritis (RA), necessitating careful management and routine monitoring to improve prognosis and prevent complications. This study aimed to investigate the clinical and biological characteristics of gammopathy in patients with SpA and RA, with a particular focus on its progression and long-term outcomes.

Patients and Methods

This retrospective study was conducted over 23 years (2000–2023) and included patients diagnosed with SpA according to the ASAS 2009 criteria or RA according to the EULAR 2010 criteria, who developed monoclonal gammopathy during follow-up. Clinical, biological, therapeutic, and evolutionary data were collected and analyzed.

Results

The study included 15 patients: 6 with SpA (40%) and 9 with RA (60%). Among SpA patients, the sex ratio was 5. Peripheral SpA was present in 33.3% of cases, axial SpA in 16.7%, and combined axial and peripheral SpA in 50%. Extra-articular manifestations included Crohn's disease (16.7%), psoriasis (16.7%), and uveitis (16.7%). HLA-B27 was positive in 16.7% of cases. Treatments included NSAIDs (83.3%), sulfasalazine (50%), methotrexate (33.3%), and biologics (33.3%). The mean age at SpA diagnosis was 46 ± 2 years, while the mean age at gammopathy diagnosis was 49 ± 3 years, with an average interval of 2.8 years between the two diagnoses. The gammopathy type was IgG kappa in 5 cases (83.3%) and IgA lambda in 1 case (16.7%). Three patients (50%) had monoclonal gammopathy of undetermined significance (MGUS), and three (50%) had multiple myeloma. The mean follow-up duration was 4.8 ± 2.3 years. MGUS cases remained stable, whereas among patients with multiple myeloma, 2 responded to chemotherapy and autologous stem cell transplantation with remission, while 1 patient died. Among RA patients, the sex ratio was 0.8. Seropositive RA was present in 66.7% of cases, and erosive disease in 66.7%. Treatments included sulfasalazine (33.3%), methotrexate (55.6%), biologics (11.1%), and corticosteroids (88.9%). The mean age at RA diagnosis was 54.6 ± 4.3 years, while the mean age at gammopathy diagnosis was 63 ± 4 years, with an average interval of 7.2 ± 3.2 years between the two diagnoses. The gammopathy type was IgG kappa in 5 cases (55.6%), IgG lambda in 1 case (11.1%), IgA lambda in 1 case (11.1%), and biclonal (IgG and IgA lambda) in 1 case (11.1%). MGUS was ob-

served in 66.7% of cases (6 patients), and multiple myeloma in 33.3% (3 patients). The mean follow-up duration was 5.2 ± 1.5 years. Among MGUS cases, 5 (83.3%) remained stable, while 1 evolved into indolent myeloma. Among patients with multiple myeloma, 1 responded favorably to chemotherapy and autologous stem cell transplantation.

Conclusion

The majority of patients with SpA or RA and monoclonal gammopathy are diagnosed at the MGUS stage, with IgG kappa being the predominant subtype, and a stable clinical course. However, the potential progression to malignant conditions, particularly multiple myeloma, highlights the necessity for ongoing monitoring to effectively manage these risks.

P1169

ETIOLOGICAL SPECTRUM OF NON-DEGENERATIVE SPINAL CORD COMPRESSION IN RHEUMATOLOGY: ANALYSIS OF 58 CASES

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Introduction

Spinal cord compression (SCC) is a potential complication of various conditions encountered in rheumatology, often associated with poor prognosis. This study aims to describe the etiological profile of SCC cases managed in a rheumatology department.

Patients and Methods

This retrospective study included patients hospitalized for SCC over 33 years (1990–2023). Traumatic SCC, degenerative causes (disc herniation and cervical spondylotic myelopathy), and intradural causes (schwannomas and meningiomas) were excluded.

Results

Fifty-eight patients were included, with a male-to-female ratio of 1.5 and a mean age of 63 years. Compression was thoracic in 58.2%, lumbar in 41.3%, and cervical in 10.3%. The etiologies identified were multiple myeloma (MM) in 16 cases (27.5%), bone metastases (BM) in 13 cases (22.4%), infectious spondylodiscitis (ISD) in 21 cases (36.2%), skeletal fluorosis in 4 cases (6.8%), Paget's disease in 3 cases (5.1%), and primary bone tumors in 1 case (1.7%).

Among the patients with multiple myeloma, the subtypes identified included IgG (50%), IgA (25%), and light-chain MM (25%). Compression was thoracic in 43.7% and lumbar in 56.2%. All 16 patients received corticosteroids, 10 underwent decompressive radiotherapy, and 4 were considered for laminectomy.

In cases of bone metastases, compression was thoracic in 53.8% and lumbar in 46.1%. The primary tumor sites were pulmonary in 4 patients, renal in 2 patients, gastrointestinal in 3 patients, breast in 1 patient, prostate in 1 patient, and undetermined in 2 patients. All 13 patients received corticosteroids and decompressive radiotherapy.

For infectious spondylodiscitis, the etiologies included tuberculosis in 42.8% of cases, brucellosis in 23.8%, and pyogenic infections in 33.3%. Compression was thoracic in 57.1%, lumbar in 38%, and cervical in 4.7%. Surgery was necessary for 23.5% of patients, and corticosteroids were administered in 57.1% of cases.

All 4 cases of skeletal fluorosis presented with cervical compression. The cause was hydrotelluric exposure in all cases, with imaging showing diffuse osteosclerosis and interosseous membrane ossification. MRI revealed ossification and hypertrophy of the posterior longitudinal ligament. Two patients underwent decompressive cervical laminectomy.

Paget's disease was identified in 3 cases, with thoracic and lumbar compression.

The single case of a primary bone tumor was a chordoma with cervical compression. Management included tumor excision followed by radiotherapy.

Conclusion

Excluding degenerative vertebral disorders, SCC can result from a variety of conditions, primarily malignancies and infections. In our series, infectious spondylodiscitis was the leading cause of SCC, followed by multiple myeloma and vertebral metastases.

P1170

AN INSIGHT INTO SEPTIC ARTHRITIS OF THE BONY PELVIS: A STUDY OF 11 CASES

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Introduction

Infections of the pelvic bones and joints are rare and present significant diagnostic and therapeutic challenges due to their varied clinical presentations. This study aims to describe the clinical, paraclinical, and prognostic features of cases of infectious sacroiliitis and septic arthritis of the pubic symphysis observed in a rheumatology department.

Patients and Methods

We conducted a retrospective study including patients hospitalized in our department for infectious sacroiliitis or septic arthritis of the pubic symphysis over a 13-year period (2010–2023). Clinical, biological, radiological, therapeutic, and outcome data were collected and analyzed.

Results

Our study included 11 patients: 10 cases of infectious sacroiliitis and 1 case of septic arthritis of the pubic symphysis. Among the sacroiliitis cases, the sex ratio was 1:1, with a mean age of 40 ± 19 years. The mean symptom duration was 175 days (range: 5–480 days). The main presenting symptoms were gluteal and lower back pain (90%) and hip pain (10%). Associated symptoms included fever (50%), night sweats (30%), and general health deterioration (30%). The sacroiliac involvement was unilateral in 90% of cases (50% right-sided, 40% left-sided) and bilateral in 10%.

An infection source was identified in 50% of cases: pulmonary (2 cases), genital in the postpartum context (1 case), urinary (1 case), and cutaneous (1 case). One patient reported previous tuberculosis exposure. Elevated inflammation markers were found in 80% of cases, with a mean C-reactive protein (CRP) level of 53 ± 19 mg/L and an erythrocyte sedimentation rate (ESR) of 63 ± 16

mm. Sacroiliac X-rays were abnormal in 60% of cases. MRI or CT scans were performed in all cases, revealing soft tissue involvement in 70%. Hip osteoarthritis was associated in 20% of cases. Biopsy was performed in 90% of cases, contributing to diagnosis in 30%. Infectious sacroiliitis was caused by pyogenic bacteria in 70% of cases and non-pyogenic bacteria in 30% of cases (*Brucella* species in 20% and Mycobacterium tuberculosis in 10%). Isolated pyogenic pathogens included Staphylococcus species (2 cases), Gram-negative bacilli (1 case), and Streptococcus species (1 case). All patients received appropriate antibiotics based on the identified pathogens, with a mean duration of 63 ± 18 days for pyogenic infections and 9 months for brucellosis and tuberculosis. The outcome was favorable in 90% of cases, with one reported death.

The case of septic arthritis of the pubic symphysis involved a 16-year-old boy presenting with bilateral gluteal pain along with fever. The infection source was cutaneous. X-rays revealed lysis of the left pubic bone, while MRI showed arthritis of the pubic symphysis with an associated soft tissue abscess. A CT-guided biopsy identified Staphylococcus aureus in the microbiology exam. A 60-day course of appropriate antibiotics resulted in a favorable outcome.

Conclusion

Our study showed that infectious sacroiliitis and septic arthritis of the pubic symphysis remain rare diagnostic entities. MRI and CT-guided biopsy are pivotal for diagnosis. The prognosis is generally favorable with appropriate antibiotic treatment.

P1171

EXPLORING THE BURDEN OF GLUCOCORTICOID-INDUCED OSTEOPOROSIS IN POLYMYALGIA RHEUMATICA: PREVALENCE AND ASSOCIATED FACTORS

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Introduction

Polymyalgia rheumatica (PMR) is the most common inflammatory rheumatic disease affecting older individuals. The current cornerstone of treatment is long-term oral glucocorticoid therapy. However, management of these patients is often complicated by comorbidities such as osteoporosis. The aim of our study was to determine the prevalence of glucocorticoid-induced osteoporosis in patients with PMR and to investigate the factors associated with its occurrence.

Patients and Methods

We reviewed the medical records of patients diagnosed with PMR in the rheumatology and internal medicine departments during the period between 2012 and 2023. Data including demographic characteristics, clinical history, treatment details, and bone health assessments were collected and analyzed.

Results

Forty-three patients were included, with a sex ratio of 0.34. The mean age was 71.8 ± 3.6 years. Horton's disease was associated in 4.7% of cases. All patients were treated with systemic glucocorticoids, with a mean dose of 17.14 ± 2.8 mg/day and a mean duration of 2.7 ± 0.5 years. Glucocorticoid-sparing strategies were implemented in 20.9% of cases. All patients received calcium and vitamin D supplementation. Glucocorticoid-induced osteoporosis was identified as a comorbidity in 20.9% of patients. The mean lumbar spine T-score was -3.2 ± 0.1, and the mean femoral T-score was -1.2 ± 0.22. Severe osteoporosis (T-score < -3) was observed in 13.9% of patients. In our study, osteoporosis was significantly associated with hypertension ($p = 0.002$). Additionally, lumbar spine T-scores were negatively correlated with the duration of systemic glucocorticoid therapy ($p = 0.02$, $r = -0.9$).

Conclusion

This study highlights a high prevalence of glucocorticoid-induced osteoporosis in patients with PMR, emphasizing the need for proactive management of bone health in this population. The duration of glucocorticoid therapy was strongly correlated with bone mineral density loss. These findings underscore the importance of regular bone density monitoring and the implementation of strategies to minimize glucocorticoid exposure, alongside adequate osteoporosis treatment.

P1172

CLINICAL AND EVOLUTIONARY PROFILE OF UNDIFFERENTIATED ARTHRITIS: WHEN GENDER MAKES A DIFFERENCE

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Introduction

Early diagnosis of inflammatory arthritis is crucial for optimizing management. However, some cases remain unclassifiable despite an in-depth investigation, referred to as undifferentiated arthritis (UA). This study aims to assess the characteristics and evolutionary profile of UA, with a focus on gender differences.

Patients and Methods

This was a retrospective descriptive study involving patients diagnosed with UA and followed in our rheumatology department over a 10-year period (2012–2022). Epidemiological, clinical, paraclinical, and evolutionary data were collected and compared between male and female patients.

Results

The study included 70 patients (53 women and 17 men) with a mean age of 53 ± 2.2 years (range: 19–84). The sex ratio was 0.32. The mean follow-up duration was 19.8 ± 3.7 months (range: 1–108).

In the female group (FG), the mean age at symptom onset was 41 ± [12–71] years. The primary clinical presentations were oligoarthritis (50.9%), polyarthritis (26.4%), and monoarthritis (22.6%). The average consultation delay was 836 ± 230 days (range: 2–7300). Extra-articular manifestations, including ocular (35.8%), cutaneous (9.4%), and renal (1.9%) involvement, were observed in 41.5% of cases. Laboratory findings revealed high inflammatory markers in 81.1%, anemia in 50.9%, positive rheumatoid factor in

7.5%, anti-citrullinated peptide antibodies in 5.7%, and antinuclear antibodies in 11.3%. X-ray abnormalities were reported in 18.9%. Evolution showed rheumatoid arthritis (RA) in 13.2% of cases and spondyloarthritis in 1.9%, while 58.5% remained undifferentiated. In the male group (MG), the mean age at symptom onset was 51 ± 4.7 years [12–71]. Monoarthritis was the most frequent presentation (41.2%), followed by oligoarthritis (35.3%) and polyarthritis (23.5%). The mean consultation delay was shorter at 225 ± 107 days (range: 1–3650). Extra-articular manifestations, including ocular (11.8%) and cutaneous (5.9%) involvement, were observed in 17.6% of cases. High inflammatory markers were present in 88.2%, anemia in 29.4%, and positive autoantibodies (rheumatoid factor, anti-citrullinated peptide antibodies, and antinuclear antibodies) in 11.8%. X-ray abnormalities were present in 17.6%. Evolution revealed RA in 5.9%, spondyloarthritis in 5.9%, and other connective tissue diseases in 11.8%, while 35.3% remained undifferentiated.

Comparative analysis showed that men had a shorter consultation delay (p = 0.037) and a higher frequency of evolution into connective tissue diseases (p = 0.049) compared to women. No other statistically significant differences were noted between the groups.

Conclusion

This study demonstrated that women with UA were characterized by oligoarticular onset and frequent extra-articular manifestations, while men more often presented with monoarthritis, shorter consultation delays, and a tendency to evolve into connective tissue diseases. These findings highlight the importance of considering gender in the management of UA. Further studies with larger cohorts are warranted to confirm these results.

P1173

THE IMPORTANCE OF THE SALT TRANSPORT ASSESSMENT ANALYSIS IN THE MANAGEMENT PATIENTS WITH METABOLIC DISORDERS OF BONE TISSUE AND NEPHROLITHIASIS

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Resume

Kidney stone disease (KSD) is a polyetiological disease associated with a metabolic disorder accompanied by the formation of stones in the urinary tract. Many factors affect the cause of stone formation. It depends on the peculiarities of climatic, socio-economic conditions, food and drinking regime, heredity, concomitant diseases, and taking medicines. More and more recently, in modern literature, there has been a hypothesis regarding the association of KSD with metabolic diseases of bone tissue. Possible reasons for the relationship are increased crystalluria in the combined course of these diseases, especially associated with calcium metabolism in connection with osteopenia or osteoporosis.

The aim of the study was to evaluate bone mineral density (BMD) and salt transport analysis in patients with and without urolithiasis.

Materials and methods.

Assessment of the BMD and TBS was carried out on the basis of the Ukrainian Osteoporosis Center of the State University "Institute of Gerontology named after D. F. Chebotareva of the National Academy of Sciences of Ukraine", Kyiv, Ukraine (chief Prof. N.V. Grygorieva). To assess crystalluria qualitatively, a study of 24h-salt transport was conducted.

The results.

The study included 80 patients, 15 men (18.8%) and 65 women (81.3%). Patients were divided depending on the presence of KSD. The I group included 32 participants without KSD (women — 31 (96.9%), men — 1 (3.1%), median age 63.2 [58.8-67.4] years. The II group included 48 patients with KSD (women — 34 (70.8%)), men – 14 (29.2%), average age 55.5 years [51.5-62.5]).

When dividing the groups depending on the presence of KSD, it was established that a normal BMD in the 1st group was established in 10 patients out of 32 (31.2%), among them 9 women (28.1%) and 1 man (3.1%). BMD abnormalities within osteopenia were found in 13 patients (40.7%), all were women. Osteoporosis was diagnosed in 9 patients (28.1%), all were women.

In the II group with established KSD, normal BMD was observed in 11 patients out of 48 (22.9%), among them 4 women (8.3%) and 7 men (14.6%). BMD abnormalities within osteopenia were found in 16 patients (33.3%), among them 12 women (25%) and 4 men (8.3%). Osteoporosis was diagnosed in 21 patients (43.8%), 18 women (37.5%) and 3 men (6.25%).

During the comparative analysis of X-ray densitometry, it was established that there was no difference between BMD indicators at the level of the lumbar spine, the right femoral neck, the left femoral neck, and the ultra distal part of the forearm bones. However, the TBS bone quality index was significantly lower in women with KSD ($p<0.05$).

During the analysis of salt transport, it was established that in group I, oxaluria was established in 2 patients (6.25%), calciuria in 3 (9.3%), phosphaturia in 2 (6.25%), increased excretion of uric acid in 2 patients (6.25%). In the II group, a significant percentage of oxaluria was determined - 27 cases (56.3%), calciuria was observed in 5 cases (10.41%), as well as phosphaturia. In patients with KSD, the level of oxalate excretion probably exceeded both the indicators of the approximate reference norm and the indicators of patients without nephrolithiasis ($p<0.05$).

Patients with osteopenia were recommended to take calcium citrate (2400 mg), magnesium (25 mg), zinc (3.75 mg), vitamin K 2 (50 μg), and vitamin D (1000 IU). In patients with osteopenia and calciuria, an increase in calciuria was revealed after 1 month. Taking into account the recommendations of the European Association of Urologists 2023, the intake of calcium preparations was stopped and indapamide 2.5 mg was prescribed. After 1 and 6 months, repeated analysis of salt transport showed the normalization of indicators and the absence of negative dynamics of BMD. Taking a combined preparation of calcium, magnesium, zinc, vitamin K2, and vitamin D in patients with oxaluria normalized both crystalluria and BMD.

Conclusions. The obtained data indicate the need for ultrasound examination of kidneys and 24-hour salt transport results while checking BMD in patients at risk of osteoporosis to diagnose nephrolithiasis early and correct further management of patients with crystalluria.

Key words: nephrolithiasis, osteoporosis, calciuria, oxaluria, Trabecular Bone Score.

P1174

OSTEOCALCIN LEVELS IN ADOLESCENTS WITH IDIOPATHIC SCOLIOSIS, DEPENDING ON THE DEGREE OF SPINAL CURVATION

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Objective: Idiopathic scoliosis (IS) has traditionally occupied high ranking places in the structure of diseases of the skeletal system for several decades. The characteristic feature of IS is progression of disese, especially in adolescents. It is possible to objectively assess the state of bone tissue in this contingent by using bone metabolism indicators. Osteocalcin (OC) is a vitamin K-independent protein, an indicative indicator of bone tissue synthesis. In a previous study, we found a decrease in the concentration of OK in the group of patients with IS without detailing the indicator depending on the degree of spinal deformation.
Methods: The 152 patients with IS aged 15.26±0.04 years (62 boys and 90 girls) were examined. In accordance with the clinical and radiological classification of IS, the following were identified: impaired posture (curvature angle of the spinal axis - up to 5 °) - 44 people, grade I IS (curvature 5-10 °) - 69 people, grade II IS (curvature 11-30 °) - 25 people, grade III IS (curvature 31-61 °) - 14 people. The control group included 20 practically healthy peers. The quantitative content of OK in the blood serum was determined by the method of solid-phase enzyme immunoassay using the N-MID Osteocalcin test system (Nordic Bioscience Diagnostics A/S, Canada).
Results: Depending on the degree of IS, the OK level in the group of adolescents sharply decreased in comparison with the age norm (93.4±14.1 ng/ml) and with the CG (96.66±2.17 ng/ml, $p<0.001$). The indicator was: with posture disorders - 81.41±0.98 ng/ml, scoliosis of the 1st degree - 77.34±0.98 ng/ml, scoliosis of the 2nd degree - 70.84±0.82 ng/ml, scoliosis of the 3rd degree - 66.41±0.69 ng/ml. When comparing the indicators by gender, taking into account the degree of curvature of the spine, no reliable differences were found ($p>0.05$).
Conclusion: Thus, adolescents suffering from IS, a pronounced dynamics of a decrease in the concentration of OC with an increase in the degree of curvature of the spine is determined. This result allows us to state a rapid slowdown in the osteosynthesis process proportional to the progression of IS. The primary task remains early diagnosis of IS and timely comprehensive treatment and preventive measures aimed at normalizing bone metabolism processes in a young organism.

P1175

THE EFFICIENCY OF SANATORIUM-RESORT TREATMENT IN ADOLESCENTS WITH SCOLIOSIS ACCORDING TO OSTEODENSITOMETRY

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Objective: Rehabilitation in childhood and adolescence is a key stage in the formation of a healthy generation. Effective and low-cost measures include the stay of sick children in sanatorium-resort conditions. The high prevalence of musculoskeletal diseases among children, namely postural disorders and idiopathic scoliosis, dictates the need for increased attention to this contingent.
Methods: A total of 32 adolescents near 15-16 years old were observed at the rehabilitation stage in the spa conditions of Yevpatoriya. The participants were stratified into 4 groups according to diseases: with posture disorders (13), with scoliosis grade I (12), grade II (5) and with III (2). Spa treatment included: climatotherapy and balneotherapy, mud therapy, massage, calcium-containing diet (up to 1500 mg per day). The structural and functional state of bone tissue was determined using ultrasound densitometry on the calcaneus (osteodensitometer "Achilles +", Lunar-General Electric Medical Systems, USA). The examination was carried out upon admission to the sanatorium (1 day) and after 21 days.
Results: Before the start of the spa treatment, osteopenia and osteoporosis were registered in 16 people (50%). After the treatment, no signs of osteopenia were registered in 1 person (3.22%). The sigmoid deviation (SD) decreased in the group as a whole from -1.3 to -1.07 (by 17.69%), with posture disorders - from -0.33 to -0.07 (by 78.79%), with scoliosis of the 1st degree - from -1.76 to -1.52 (by 13.64%), with scoliosis of the 2nd degree - from -2.16 to -2 (by 7.41%), with scoliosis of the 3rd degree - from -2.77 to -2.62 (by 5.42%).
Conclusion: The standard spa treatment in adolescents with posture disorders and scoliosis contributes to the positive dynamics of changes in the skeletal system. With an increase in the degree of spinal deformation, changes in densitometry indicators are less significant.

P1176

THE FEATURES OF DENTAL HISTORY IN PATIENTS WITH JUVENILE RHEUMATOID ARTHRITIS

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Objective: In recent years, the incidence of juvenile rheumatoid arthritis (JRA) has increased worldwide. In this disease, various organs and systems are involved in the pathological process, including those in the maxillofacial region. In particular, the tem-

poromandibular joints, salivary glands, teeth, and periodontal tissues may be involved in the pathological process. The aim of our study was to investigate the features of the anamnesis data of children and adolescents with pathology of the dental system, suffering from JRA.

Methods: We collected anamnestic data from 307 children and adolescents aged 5-16 years (mean age - 11.08 ± 3.11 years), who were undergoing spa treatment at the State Institution "Children's Specialized Clinical Sanatorium "Zdravnitsa" in Yevpatoria with a diagnosis of JRA. The diagnosis of somatic disease was established by specialized doctors. The examination of patients was carried out in a dental office according to the standard method.

Results: Among the examined contingent, 24 (7.82%) people did not present complaints from the dental system. The presence of destroyed teeth was noted by 204 (66.45%) patients. Periodically occurring dry lips were found in 178 (57.98%) patients. Dry mouth (in the morning, after physical activity) bothered 127 (41.37%) people. Periodic pain and discomfort in the temporomandibular joint area was noted by 38 (12.38%) people. 98 (34.39%) children complained of periodic bleeding gums when brushing their teeth. During the external examination of the maxillofacial area of patients with JRA, we noted a disproportion of the lower third of the face (V-shaped narrowed or pointed chin, in some cases - protruding angles of the lower jaw, a large nose - "bird face") in 66.45% of cases (204 people) - a typical sign characteristic of this somatic pathology.

Conclusion: The studies have shown that in patients with JRA, in most cases, habitus has certain signs characteristic of rheumatoid arthritis. Dry mouth may indicate reactivity of the salivary glands. A possible reaction from the temporomandibular joint indicates polyarticular reactivity of the body. Thus, the obtained data are a prognostic sign of the development of JRA in a child and can be used by a pediatrician at the stage of Diagnosis praecox.

P1177

X-RAY CHARACTERISTICS OF PERIODONTAL BONE TISSUE IN ADOLESCENTS WITH GENERALIZED PERIODONTITIS, SUFFERING FROM IDIORPTIC SCOLIOSIS

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Objective: According to published WHO studies, 100% of children at the age of 14 suffer from gingivitis. In recent years, according to literary data, the prevalence of generalized periodontitis (GP) also increases in adolescence. During the same age period, progression of idiopathic scoliosis (IS) is noted – 4-5 times – one of the most common diseases of the musculoskeletal system. The unity of metabolic processes occurring both in the bone tissue (CT) of the spine and in CT of the alveolar processes is confirmed. In clinical dental practice, objective X-ray diagnostics is the most accessible and accessible method for analyzing the CT state of the alveolar processes of the jaws.

Methods: We analyzed 60 orthopantomograms of patients with GP of the initial – 1st degree (classification of periodontal diseases, N. F. Danilevsky, 1994), suffering from postural disorder (PD) (22 images – 36.67%) and idiopathic scoliosis of the 1st degree (38 images – 63.33%).

Results: The analysis of orthopantomograms revealed changes diagnosed in GP of the initial – 1st degree. Signs of osteoporosis, widening of the periodontal gap and unclear contours of the compact plate were detected sporadically in 17 (77.28%) patients with OI and grade I scoliosis in 23 (60.53%) patients. Signs of osteoporosis of a diffuse nature and poor contouring of the compact plate were detected in 5 (22.72%) patients with OI and in 10 (26.32%) patients with grade I scoliosis. Osteoporosis phenomena and destruction of the cortical plate were detected in 5 (13.15%) patients with grade I scoliosis.

Conclusion: The conducted studies have shown that with an increase in the degree of spinal curvature in patients with initial – grade I GP, the frequency of recording more pronounced and profound changes in CT of the alveolar processes on orthopantomograms increases, which must be taken into account when drawing up treatment regimens and preventing periodontitis.

P1178

CALCIUM-DEPENDENT MECHANISMS OF REPARATIVE PROCESSES IN ADOLESCENTS SUFFERING FROM BRONCHIAL ASTHMA AND GENERALIZED PERIODONTITIS

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Objective: One of the leading places in the occurrence and implementation of pathogenetic mechanisms is given to calcium homeostasis. It is necessary to deeply study the biochemical, physiological and physicochemical patterns of calcium metabolism. In bronchial asthma (BA), calcium is involved in the processes of induction and release of mediators of allergic reactions, bronchospasm, functioning of glands producing bronchial secretions. Complex and to date not fully understood mechanism of calcium transport through the cell membrane. Treatment of generalized periodontitis (GP) is a complex and lengthy procedure, GP. Measures for the treatment and correction of GP are most effective in adolescence - the period of formation of the body, when the complete formation of periodontal tissues is not yet complete. All of the above has determined the interest in studying individual parameters of calcium homeostasis in the context of reparative processes of GP with BA.

Methods: 70 adolescents aged 15-16 years (28 boys and 42 girls) with GP and persistent mild to moderate BA in the remission phase are observed. They formed the main group (MG). The comparison group (CG) - 25 peers with severe BA without GP. The control group (CG) - 20 practically healthy peers. Calcium is one of the most important minerals for humans. The level of calcium in urine depends on its concentration in the blood and on kidney

function. Biochemical analysis of urine for calcium was done by the Sulkovich test.

Results: The calcium content in biological environments in MG patients blood before treatment 2.43±0.04, after treatment 2.51±0.06 mmol / l. Saliva before treatment 1.36±0.04, after treatment 1.38±0.05 mmol/l. In urine in GS up to 3.49±0.23, after 5.16±0.20 mmol/l.

Conclusion: The results of the study of individual indicators of calcium homeostasis in children showed that the level of calcium in the blood and saliva does not change. Studies have shown a more significant increase in the concentration of calcium in the urine at the end of treatment was observed in children with severe persistent bronchial asthma and GP.

P1179

PREVALENCE OF DENTAL CARIES IN PATIENTS WITH BRONCHIAL ASTHMA

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Objective: Research by scientists has shown that one of the factors in the development of caries is somatic pathology. It is known that the chronic course of any somatic pathology, in particular bronchial asthma (BA), is accompanied by a deterioration in the complex-organ capabilities of the child and the suppression of non-specific resistance of the body, including organs and tissues of the oral cavity. The results of clinical studies have shown that in children with BA, the prevalence and intensity of caries is higher in comparison with practically healthy children. It has been proven that the severity and duration of the disease affects the condition of hard dental tissues in children with BA. Among the causes that aggravate the condition of the oral organs, medications are distinguished. Inhaled glucocorticoids can cause changes in oral fluid parameters (reduce the rate of salivation, increase viscosity and decrease pH of oral fluid, change in local immunity parameters). They are prescribed to patients with bronchial asthma for long periods and almost constantly.

Methods: The study included 82 patients suffering from persistent bronchial asthma of moderate and mild severity, aged 7 to 12 years - the main group (MG). The control group (CG) consisted of 20 somatically healthy children and adolescents matched for age and gender.

Results: It was found that the prevalence of caries in patients with bronchial asthma was 93%. This is 49.84% higher than in the CG (43.16%) ($p < 0.001$). The highest prevalence and intensity of dental caries is observed in children with persistent moderate bronchial asthma – 91.1% and 1.8±0.7 ($p<0.05$), with mild asthma 85.4% and 1.04±0.02 ($p<0.05$), respectively.

Conclusion: Considering the significance level of the $p<0.05$ criterion, it should be concluded that there is a statistically significant difference between the arithmetic means of caries intensity in children with persistent moderate and mild bronchial asthma. The high prevalence of caries in patients with bronchial asthma compared to practically healthy children and adolescents indicates a significant role of bronchial asthma in the pathogenesis of caries development. Considering the progressive course of bronchial asthma, patients need systematic preventive measures of exogenous and endogenous nature. This issue is of interest for further study.

P1180

CLINICAL AND IMMUNOLOGIC SIGNIFICANCE OF FIBRONECTIN PARAMETERS IN PATIENTS WITH RHEUMATIC DISEASES

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Due to the variety of properties of fibronectin (FN), the main of which are opsonizing, adhesive and chemotactic, its role in the pathogenesis of autoimmune diseases becomes obvious. During the inflammatory process the increased demand for opsonins, and first of all for FN, is compensated by its mobilization from the vascular wall, which leads to permeability disturbance and may be one of the key links in the pathogenesis of vasculitis. The increase in plasma FN concentration in systemic lupus erythematosus (SLE) and overlap syndrome is due to its hyperproduction by tissue macrophages and fibroblasts. In systemic scleroderma (SSD) the amount of bioactive FN (having unoccupied collagen domains) is reduced in patients with the III degree of disease activity, which reflects the depletion of opsonic activity of FN binding immune complexes and tissue derivatives. Its accumulation at the dermoepidermal border was also found, explained by local synthesis of FN by fibroblasts. A number of studies have revealed a correlation between the level of bioactive FN in the blood plasma of patients with rheumatoid arthritis (RA) and the degree of activity of the pathological process.

Objective: to study the content of AT to FN in blood sera of patients with RA, SLE and SSD by solid-phase enzyme-linked immunosorbent assay (ELISA) using immobilized granular antigenic preparations IGAP.)

Materials and Methods. Serum of 30 practically healthy individuals, 75 RA patients, 40 SLE patients and 20 SSD patients was analyzed. Antibodies to FN were determined in ELISA-test (classical method) and in ELISA-test with the use of magnetosorbents (modified by Gontar I.P. et al., 2002). The obtained results were expressed in units of optical density (e.o.p.).

Results. In the study of blood sera of healthy individuals the level of AT to FN was 0.03±0.01 e.o.p. Elevated levels of AT to FN in ELISA-test were revealed in 14 (17,6%) RA patients, 16 (40%) SLE patients and 6 (30%) SSD patients. In RA, the severity of antibodies to FN depended on the presence of extra-articular manifestations ($p<0.02$), and in 79% of cases increased levels of AT to FN

were found in patients with RPE and CNS lesions. In SLE patients, the level of AT to FN significantly depended on the activity of the pathologic process (p<0.02). In the presence of skin manifestations and when joints were involved in the pathologic process (arthritis, arthralgia), the percentage of detection of AT to FN in SLE increased to 70 and 72%, respectively. Heart (p<0.05), lung and nervous system (p<0.001) damage in SCD was most often accompanied by an increase in the level of AT to FN.
Conclusions: Thus, monitoring of AT to FN by MS due to the high sensitivity of the method and the possibility of detecting specific antibodies in the nanogram range can be used to predict the clinical variant course.

P1181

DIAGNOSTIC FEATURES IN SLE PATIENTS WITH THYROID DYSFUNCTION

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The association of systemic lupus erythematosus (SLE) and autoimmunity is now well established, including the fact that both diseases are associated with HLA-DR3. In a recent study of 300 patients with SLE, 5.7% were found to have autoimmune hypothyroidism, 1.7% had Graves' disease, and 14% carried antithyroid antibodies. Screening evaluation of thyroid function in patients with SLE is well justified.
Objective. To evaluate the clinical and immunologic status of patients with systemic lupus erythematosus with thyroid pathology.
Materials and Methods. 70 patients with systemic lupus erythematosus were examined. In the studied group high (III) degree of pathologic process activity was observed in 9.3% of patients, average (II) - in 56.0%, low (I) - in 34.7% of patients. The average index of SLICC/ACR DI damage index in the examined patients amounted to 2.39±0.16 points. Skin manifestations (56.7%), joint lesions (in 59.7%), kidney (in 69.3%), lung (56.9%), blood (74.2%), constitutional disorders (61.1%), and Raynaud's syndrome (65.3%) were diagnosed. Almost one third of patients had antiphospholipid syndrome (25.6%). The patients were tested for TTG, T4 and TK levels using commercial RIA kits (AMERLEX-MAB FT) ELISA kits.
Results and Discussion. In the examined patients with SLE, thyroid changes were detected in one third of patients 33.5% (p=0.0001), which was significantly higher than the general population value. Autoimmune thyroiditis was found in 201%; 17.2% of patients were diagnosed with nodular goiter of the 1st and 2nd degree; diffuse goiter - 3.5%, mixed goiter - 7%. Thus, the dominant thyroid pathology in SLE was expectedly autoimmune thyroiditis. From the functional point of view, SLE patients with thyroid pathology had predominantly reduced (59.3%) and, less frequently, normal thyroid function (40.1%). Hypothyroidism was more often subclinical (24.2%) and mild (18.2%), and less often moderate (15.2%).
Conclusions. Thus, all patients with systemic lupus erythematosus need clinical evaluation of thyroid lesions with mandatory determination of thyroid hormones, antithyroid antibodies, and ultrasound parameters of the organ for timely detection of thyroid pathology, due to the latency of the course of this pathology, as well as in the dynamics.

P1182

THE EFFICACY OF THE TREATMENT WITH ROMOSOSUMAB IN COMMON POPULATION

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Background: Osteoporosis is underdiagnosed and undertreated. 200 millions women suffer with osteoporosis worldwide, less than 1 out of 5 is diagnosed, less than 1 of 3 will receive treatment after a fracture[3]. The risk of the fractures is not linear over time. The relative risk of fracture is highest immediately after the first fracture. Approximately 41% of subsequent fractures in women and 52% in men occur within 2 years after the first fracture. Recent fractures (e.g. within the last 1-2 years) are a stronger risk factor for subsequent fractures than previous fractures (e.g. a fracture several years ago). Patients are at immediate risk of subsequent fractures at 1-2 years after the initial fracture. The risk of another fracture increases with each new fracture. The risk of fractures after multiple fractures is higher than in patients with a single fracture. The greater the number of fractures, the greater the risk of subsequent fractures is. The risk of fractures gradually increases with age, but certain events (initiation of antidepressant therapy, the first fracture,..) cause an increase in risk and can thus worsen the risk trajectory.
1 year after proximal femoral fracture 40% of patients are unable to walk without support, 80% of patients are limited in normal activities (driving, shopping)
Mortality within 12 months after fracture of proximal humerus is 10%, after fracture of thoracic or lumbar vertebrae is 14%, after fracture of proximal femur is 31%.
Treatment started immediately after a fracture can prevent higher number of new fractures compared to treatment given later.
Romososumab is drug of the choice in the treatment of the postmenopausal osteoporosis for the patients in the highest risk of fracture. Usually we have data from multicentric, randomized, double blind, placebo or active comparator controlled trials. The efficacy of the romososumab was performed on the study population, which fulfiled inclusion and exclusion criteria.
Objectives: To confirm effect of treatment with romososumab in common population
Methods: There are 18 patients treated with romososumab in our centre from October 2023 till December 2024. All of them met the indication reimbursement criteria of romosozumab (T-score -2.5 SD + osteoporotic fracture). They have not been diagnosed with MI and/or stroke. 3 of them have not been treated for more than 1 month, their results are not included.
Our patients underwent:

Entrance examination: medical history, physical examination, laboratory examination, DEXA, x-ray, education for self-administration
Checkups: baseline, weeks 4, 12, 24, 36, 52
Questions: question whether stroke, MI, IDLL, coronary angiography was performed since the last check-up?
Patients are required to receive the first 2 injections on site
Monitoring objectives: PINP, BetaCTX-I, OC, Ca, PTH in week 0, 2, 4, 12, 24, 36, 52
DXA before and 12 months after initiation of therapy
Side effects in week 0, 2, 4, 12, 24, 36, 52

Results:
Age: Average: 74.6
The oldest p: 82
The youngest p: 64

Comorbidities:

Postmenopausal only	6
+ rheumatoid arthritis +glucocorticoid therapy + biologic therapy	3
+ psoriatic arthritis	1
+ carcinoma in anamnesis	2
+ IBD	1
+ MDS	1
+ Morbus Parkinson	1

Fractures:
Vertebral fractures 45
Patients with vertebral fractures 12
Nonvertebral fractures 18
Patients with nonvertebral fractures 11
Previous treatment:

- treatment naive	8
- BP only	2
- Deno only	0
- BP + Deno	2
- combination	
- Calcitonin Salmon + BP + SR + Deno + Teri	1
- BP + SR + Deno + Teri	1
- BP + Raloxifen + Deno	1

Teriparatide in therapy 2

Entrance Densitometry in average:

Ls/T sc (SD)	-2,9
Ls/BMD (g/cm2)	0,570
Tot.fem T sc (SD)	-2,0
Tot.fem BMD (g/cm2)	0,752
Neck T sc (SD)	-2,3
Neck BMD (g/cm2)	0,710
Rad 33% T sc (SD)	-2,8
Rad 33% BMD (g/cm2)	0,629

Laboratory results:
Ca mmol/l (2,20-2,55)
P1NP ug/l (16,27-73,78)
Beta-CTX ug/l (1,152-0,858)
OC ug/l (5,4-59,1)
PTH pmol/l (0,69- 3,9)

Till this time we have not had new fractures during treatment, no clinical adverse events. The drug was well-tolerated. Transient hypocalcemia occurred in two patients without clinical consequences. Elevation of PTH occurred in most of our patients, it is only question we need to solve.

Conclusion: Elevation of PTH occurred in most of our patients and it is only question we need to solve. All patients are supplemented with calcium and vitamin D. There is a big difference from clinical trials.
We are looking forward to seeing the DEXA measurements after one year of treatment

Key words: postmenopausal osteoporosis, PINP, BetaCTX-I, OC, Ca, PTH, densitometry, romososumab

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P1183

A CASE REPORT OF INVOLVEMENT OF CORONARY ARTERIES IN A 47-YEAR-OLD MAN WITH THROMBOANGIITIS OBLITERANS

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We present a case of a 47- years-old male smoker with complaints of chest pain, palpitations, sensation of coldness of toes and discoloration of digits in legs. The patient had a 29-year history of smoking 20 cigarettes a day. The patient had a Q-wave myocardial infarction of the posterior inferior and lateral wall of the left ventricle with transition to MI a year ago. According to the data of the performed coronary angiography, multiple, fusiform, partially thrombosed aneurysms and ectasias of the coronary vessels were detected. Previously the patient was treated according to guidelines for coronary artery disease. Given the occurrence of symptoms in the lower extremities and taking into account the

nature of coronary artery lesion, the patient was referred to a rheumatologist. Preliminary blood work-up was within the normal range. Serological tests for immunological markers and autoantibodies were normal. MRI data for the presence of induced ischemia were not obtained, no areas of hypoperfusion were detected. Arteriography of the vessels of the lower extremities excluded the presence of atherosclerosis. A biopsy of the inflammatory superficial veins of the lower extremities was performed, which showed changes characteristic of thromboangiitis obliterans. These clinical data led to a revision of the main diagnosis and a change in the treatment strategy. The presented clinical case demonstrates the need for clinical suspicion of systemic vasculitis, in particular thromboangiitis obliterans, in young people with a long history of smoking and signs of vascular damage to the lower extremities.

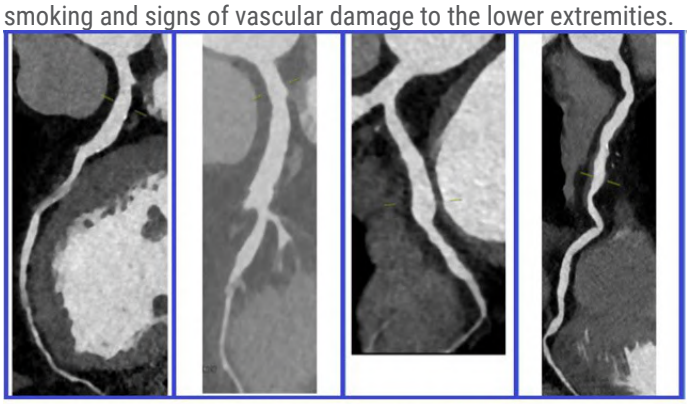

Fig. CT angiography of coronary arteries in a 47-year-old man with thromboangiitis obliterans

P1184

FRACTURE RISK ASSESSMENT, BODY MASS INDEX AND LEVEL BLOOD PRESSURE IN MILITARY SERVICEMEN WITH CHRONIC PAIN IN MUSCULOSKELETAL DISEASES

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Objective: The "FRAX®" tool is an algorithm created by the World Health Organization (WHO), in 2008, to predict the 10-year risk of hip and major osteoporotic fractures (spine, proximal humerus, hip and forearm). FRAX® algorithms express fracture risk as percentage (%) of hip and/or major osteoporotic fractures within a ten-year period based on the following variables: body mass index (BMI); history of previous fractures at classical osteoporotic fracture sites; family history of hip fracture; smoking; use of glucocorticoids; alcoholism diagnosis of and rheumatoid arthritis (RA). Musculoskeletal disorders are the leading cause of disability worldwide and represent a growing problem due to the ageing population. Risk factors of musculoskeletal disorders include: heavy physical work, smoking, high body mass index, high psychosocial work demands, and the presence of co-morbidities. Back pain, which has been reported to be the leading cause of disability in both high-income and developing countries, results in an increased fear of pain in the elderly population. Aim of our study was to evaluate the role of BMI in correlation with FRAX to predict fragility fractures in military servicemen with chronic pain in musculoskeletal diseases.

Methods: We studied 68 military servicemen with chronic pain in musculoskeletal diseases mean age 44,8±6,04 (group A) and 62 patients nonmilitary servicemen with chronic pain in musculoskeletal diseases mean age 44,6±4,8 (group B). Patients never treated with anti-osteoporotic drugs. The 10-y hip fracture risk was calculated with FRAX score and a value ≥2.5% signified an increased risk. Statistical significance was set at $p<0.05$.

Results: FRAX score in a group A was higher (6,78±4,1) than in group B (4,4±2,1) ($p<0,05$). The mean level of BMI: 30,4±4,2 kg/m2 in group A, 26,1±5,5 kg/m2 in a group B ($p<0,05$). According to FRAX score, value ≥2.5% was found in 63 patients (94%) in a group A and in 40 patients (64%) in a group B ($p<0,05$). There was correlation between the FRAX and BMI ($r=-0,42$; $p<0,05$), FRAX and fractures ($r=0,55$; $p<0,05$), FRAX and level diastolic blood pressure (BP) ($r=-0,41$; $p<0,05$) in a group A however in a group B such connection was not observed. The mean level systolic BP (124,4±9,4 mm Hg and 130,4±6,2 mm Hg, $p=0,50$) and diastolic BP changes did not significantly differ between the two groups (88,4±8,4 mm Hg and 86,8±6,2 mm Hg, $p=0,52$).

Conclusion: Risk of fracture is increased in military servicemen with chronic pain in musculoskeletal diseases. FRAX score in a group A was higher than in group B. There was correlation between FRAX score, BMI and level diastolic blood pressure in military servicemen with chronic pain in musculoskeletal diseases.

P1185

REGENERATIVE TECHNOLOGIES IN SURGICAL ORTHOPEDICS - EXPERIENCE OF MONOAXIAL FORM OF FIBROUS DYSPLASIA TREATMENT

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Objective: To improve surgical treatment outcomes for recurrent pathological lesions in long bones of patients with fibrous dysplasia (FD) by incorporating regenerative technologies.

Materials and methods: 18 patients with one or more recurrent pathological lesions of the long bones with the monoaxial form of FD (humerus - 3, femur - 11, tibia - 4) were operated. They underwent intraosseous resection of pathological lesion with alloplasty and preventive synthesis and were divided into two groups.

Group I - 10 patients with multiple recurrence of the pathological FD lesions and multiple surgical interventions;

Group II - 8 patients with recurrent FD lesions and surgical intervention, in which the surgical technique was combined with the use of regenerative technologies. In group II, bone marrow punctate in a volume of 5 ml was used for patients under 10 years old; a preparation from concentrated bone marrow aspirate, made according to the standard technique from a punctate volume of 30-60 ml was used for patients over 10 years old.

We used clinical and radiological examination methods and surgical treatment. The average age of patients is 14 years. The observation period is 24-36 months.

Results and Discussion:
Analysis revealed limited efficacy of standard methods in Group I, with recurrence of pain, lesion reappearance, and graft lysis observed within 12–36 months. In Group II, no recurrence of pain or lesions was noted within 12–24 months. Preoperative lesion volumes averaged 18 cm^3 in both groups. Radiological studies in Group II showed accelerated remodeling and improved bone quality compared to Group I.
The average graft remodeling time in Group I was 16 months, while in Group II, it was significantly shorter 11.5 months. Complications, including recurrences in Group I, are likely due to the dominance of osteoresorption over bone formation in structurally deficient bone tissue. Improved remodeling in Group II is attributed to increased levels of osteogenic precursor cells and mesenchymal stem cells.
Conclusion: Incorporating bone marrow aspirate in intramedullary resections is essential for promoting robust bone regeneration and preventing recurrences in long bones affected by FD.

P1186

TIME TREND OF THE SCIENTIFIC PUBLICATIONS IN FIELD OF MACHINE LEARNING AND BONE FRACTURE DETECTION

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Objective: Numerous recent studies have emphasized the role of artificial intelligence in the early detection of bone fractures. We conducted a bibliometric analysis of scientific publications in this field to identify time trend of the publications, productive countries and institutions, active researchers, key journals, and the most frequently indexed keywords.
Material and Methods: We carried out a comprehensive search in the Scopus web database up to 4 Oct 2024. After excluding unrelated papers, bibliometric metrics were analyzed using VOSviewer 1.6.20 and "analyze results" tool in Scopus.
Results: After an initial assessment of 2632 records, 264 studies were included in the final analysis. The earliest relevant study was published in 2006, followed by a steady increase in publications, peaking in 2024 (n=77, 29.2%). Original articles were the most common type of publications (n=195, 73.86%). The majority of studies were in the field of medicine (n=211, 79.9%). The US was the most productive country (n=77, 29.2%), followed by China (n=60, 22.7%), and South Korea (n=26, 9.8%). The main journal was "Journal of Bone and Mineral Research" (n=11, 4.2%), impact factor (IF): 5.1, followed by "European Journal of Radiology" (n=7, 2.7%), IF: 3.2. The total citation number was 2598. The most cited paper (214 citations) was titled "Handling limited datasets with neural networks in medical applications: A small-data approach", published in "Artificial Intelligence in Medicine" (IF: 6.1). The top two affiliations were from the US: "Harvard Medical School" (n=9, 3.4%) and "Flinders University" (n=8, 3.03%). Top author was "Doornberg, J.N." from the Netherlands. Out of the 587 keywords, 28 appeared at least 5 times, with the top five keywords being "machine learning", "artificial intelligence", "osteoporosis", "deep learning", and "fracture".
Conclusions: There is a growing trend in scholarly publications focusing on detection of fracture using machine learning. Our results highlight the strong position of the US and its institutions as the top-ranked country in terms of publications and researcher affiliations, and "Journal of Bone and Mineral Research" serving as a key journal for disseminating influential research.
Keywords: Machine learning, Artificial intelligence, Fracture, Bibliometric

P1187

A BIBLIOMETRIC ANALYSIS OF THE TOP 150 MOST-CITED ARTICLES ON THE FALLS IN POST-MENOPAUSE WOMEN

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Objective: Numerous studies have shown that falls are a significant risk factor for bone fracture in post-menopausal women. We aimed in the current study to bibliometric analysis of the top 150 top-cited scientific publications on this topic. We want to identify subject area of these papers, the most productive countries, institutions, active researchers, main journals, and frequently indexed keywords.
Material and Methods: We performed a comprehensive search in the Scopus database up to 5 Oct 2024. After excluding unrelated papers, we selected the top 150 most-cited papers. Then, bibliometric metrics were analyzed using VOSviewer version 1.6.20 and the "analyze results" tool in Scopus.
Results: After an initial assessment of 1254 records, among 411 included studies was analyzed 150 top-cited studies. The earliest top-cited study was published in 2004, with 780 citations out of a total 13372 citation number (5.83%). This paper entitled "Physical activity and bone health" was an original study published in "Medicine and Science in Sports and Exercise", impact factor (IF): 4.029, and CiteScore 7.7. Research articles were the most common type of publications (n=102, 68.0%). The main subject area of the papers was medicine (n=145, 96.7%). The US was the most productive country (n=47, 31.33%), followed by the United Kingdom (n=21, 14.0%). The main journal was "Osteoporosis International" (n=14, 9.33%), IF: 3.59, followed by "Menopause" (n=13, 8.66%), IF: 3.36. The top three affiliations were "University of Jaén" (Spain), "Federal University of São Paulo" (Brazil), and

"MRC Lifecourse Epidemiology Unit" (United Kingdom), each contributing 5 studies (3.33%). Top author was "Cooper, C." from the United Kingdom. Of the 1463 indexed keywords, 226 appeared at least 5 times, with the top three being "female", "aged", and "bone density".
Conclusions: Based on our results, the US and the United Kingdom held strong positions as the top-ranked countries in terms of publications, with top-institutions in Spain, Brazil and the United Kingdom emerging as leading affiliations for researchers in the field. Moreover, "Osteoporosis International" was identified as the main journal for publishing high-impact research in this field.
Keywords: Fall, Post-menopause, Fracture, Bibliometric

P1188

ORAL HEALTH IN A NATIONWIDE STUDY OF OLDER ADULTS IN IRAN

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Background: The global population is aging rapidly, and older individuals being particularly vulnerable to *oral health* problems. This study aims to assess the *oral health* status of older adults in *Iran*.
Methods: This cross-sectional study analyzed data from individuals aged 50 and older who participated in the 2021 STEPwise Approach to Non-communicable Disease Risk Factor Surveillance (STEPS) survey. The weighting procedure comprised steps: adjusting for non-response related to age groups affected by COVID-19, applying statistical formulas to mitigate bias from incomplete responses, weighting samples by age, sex, and residential area to ensure demographic representativeness, and presenting categorical data as percentages with confidence intervals (CIs).
Results: Out of 10,946 participants, 53.9% were female (95% CI: 52.8, 54.9), and 77.3% were urban residents (CI: 76.4, 78.1). The mean age was 62.0 years (Standard Error [SE]: 0.1). The prevalence of using oral hygiene devices (toothbrush, mouthwash, and dental floss) was higher among females (79.0%, CI: 77.8, 80.1) and urban residents (80%, CI: 79.1, 81.0) compared to males (72.5%, CI: 71.1, 73.8) and rural residents (62.2%, CI: 60.1, 64.2), respectively ($p < 0.001$). Overall, 10.6% of participants reported gum bleeding after eating, brushing, or flossing (CI: 10.0, 11.3), with higher prevalence in females (12.4%, CI: 11.5, 13.4), compared to males (8.5%, CI: 7.7, 9.4), and in urban areas (11.2%, CI: 10.5, 12.0) compared to rural areas (8.5%, CI: 7.4, 9.8) ($p < 0.001$). The prevalence of toothache or oral pain was 17.8% (CI: 17.1, 18.7), with females experiencing more pain than males. The prevalence of complete toothlessness and denture use was 29.5% (CI: 28.5, 30.4), while 6.5% (CI: 6.0, 7.0) of participants were completely toothless without using dentures, with rural residents being more affected by complete toothlessness than urban residents.
Conclusion: Oral health among older adults in Iran reveals notable sex and regional disparities, with urban residents and females showing better oral hygiene practices. Despite high usage of oral hygiene devices, many individuals experience gum bleeding, tooth pain, and toothlessness, highlighting the need for targeted interventions, especially in rural areas.

P1189

CLINICAL CHARACTERISTICS OF SYSTEMIC LUPUS ERITEMATOUSUS ASSOCIATED WITH ANTIBODY DYNAMICS TO THYROXINE AND TRIODOTHYRONINE

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Systemic lupus erythematosus (SLE) is a systemic disease characterized by multiple organ pathology. One of the systems affected by SLE is the endocrine, and in particular the thyroid gland. Since SLE is a polysystemic autoimmune disease in which any target organ can be affected, some authors hypothesize that combined autothyroid pathology may be a consequence of the antithyroid activity of any group of antibodies produced in SLE. It is possible that autothyroid pathology is the result of immune damage to the thyroid gland in SLE, accompanied by the deposition of immune complexes. The information available in the literature on the study of autoantibodies to thyroid hormones thyroxine and triiodothyronine (T3 and T4) in SLE is scattered and not systematized. It should be noted that the pathological effect of such antibodies has not been fully determined. In addition, thyroid pathology, in turn, can cause symptoms similar to those of SLE, since both of these diseases mainly affect women in the same age groups.
The aim of the study was to analyze the clinical and laboratory manifestations of thyroxine in accordance with the presence or absence of increased amounts of antibodies to the thyroid hormones thyroxine (T4) and triodothyronine (T3). 65 patients with SLE were examined. The average age of the patients was 52.2±5.1 years. The average duration of diseases was 3.82±3.21 years. Antibodies to thyroxine and triiodothyronine were determined by enzyme immunoassay during antigen fixation in magnetically controlled sorbents using the Gontar method, 2001.
The data was processed using the STATISTICA software package FOR WINDOWS.
In the group of patients representing the interests of people (37 people), it was revealed that the most common clinical manifestations were: skin lesions - 28 (75.7%), joints - 33 (89.1%), cardiovascular system - 34 (91.9%), nervous system - 12 (32.4%), eyes-11 (29.7%). The presence of vasculitis and polyserositis was noted in 11 people (29.7%), anemia - in 10 (27.0%), leukopenia - in 12 (32.4%), Raynaud's syndrome - in 16 (43.2%). ANF was detected in 19 (51.3%), antibodies to DNA - in 37 (89.1%) patients. However, a statistically significant difference with the group of patients with negative antibody activity ($p<0.05$) was noted only in the presence of lesions of the skin, blood vessels, joints and the cardiovascular system. In addition, kidney damage prevailed

(30% versus 27%).
Thus, a significant increase in the concentration of antibodies to thyroid hormones is revealed in patients with skin manifestations of SLE, joint syndrome and high cardiovascular risk. The data obtained make it possible to recommend the study of antibodies to T3 and T4 to all patients with damage to the cardiovascular system on the background of SLE, in order to exclude/confirm thyroid pathology.

P1190

DENTAL HEALTH OF ADOLESCENTS WITH IDIOPATHIC SCOLIOSIS

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Objective: In recent decades, there has been a trend towards an increase in the diagnosis of idiopathic scoliosis (IS). The prevalence of the disease in certain regions and different age groups is recorded at up to 40% of cases. Given the commonality of metabolic processes in the skeletal system and in the dental system in patients with IS, these pathologies are now considered as comorbid conditions.
Methods: The study involved 57 adolescent children (15-16 years old, average age 15.28±0.03 years) diagnosed with grade I IS (curvature angle 5-10°). Dental status and dental health indicators were recorded.
Results: The study revealed: soft tissue attachment anomalies (frenae of the lips and tongue) – 56.14% (n=32), dentoalveolar anomalies – 82.46% (n=47), dental caries – 87.72% (n=50), caries intensity (CFI) – 4.41±0.2, gingivitis (excluding symptomatic gingivitis) – 38.6% (n=22), periodontitis – 26.32% (n=15). The oral hygiene level according to Green-Vermillion was 1.69±0.06 points. Indicators characterizing the condition of periodontal tissues: prevalence and intensity of gingival inflammation (PMA index modified by C. Parma, 1960) – 26.6±0.82%, index of bleeding of gingival papillae – 1.16±0.05 points, combined periodontal index (PI, Russel, 1956) – 0.94±0.03 points, CPI index (determination of the volume of treatment) – 1.17±0.04 points.
Conclusion: The patients with periodontal disease in adolescence have a high prevalence of dental pathology in comparison with healthy peers. The level of oral hygiene in this contingent is defined as "satisfactory". The prevalence and intensity of caries are noted at the level of "average". This exceeds the standard values of indicators for this age.

P1191

NON-DRUG METHODS OF TREATMENT AND PREVENTION OF INITIAL DENTAL CARIES IN CHILDREN

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Objective: The problem of dental caries, despite the success achieved in reducing its prevalence and intensity throughout the world, continues to occupy a leading place among other dental diseases. Numerous works of scientists are devoted to early diagnosis, prevention and rational treatment of childhood caries. Currently, non-drug methods of treatment and prevention of caries are of considerable interest. Liquid extract of Saki therapeutic mud is produced under the name "Biol". The preparation contains a balanced complex of mineral salts present in the healing mud, trace elements, active organic substances and biogenic stimulants in high concentration. The aim of the study was to increase the effectiveness of dental caries prevention in children using natural factors.
Methods: A survey, dynamic observation and preventive measures were carried out in 235 children aged 12 in the industrial region. The Crimean Titan enterprise in the city of Armyansk is the largest manufacturer of titanium dioxide in Eastern Europe. In addition to titanium dioxide pigment, the enterprise produces red iron oxide pigment, mineral fertilizers, sulfuric acid, aluminum sulfate, liquid sodium glass, iron sulfate. And recreational - the city of Evpatoria. The intensity and prevalence of caries were determined. The effectiveness of preventive measures was assessed using the caries reduction index.
Results: A high prevalence of caries was revealed in children living in the industrial zone of Armyansk: 84%, in the recreational region 63%, respectively. Significant differences between the groups were also observed in caries intensity indicators (KPU, respectively, 3.9 ± 0.2 and 3.0 ± 0.3 ($p < 0.05$)). "Biol" was diluted in a ratio of 1:5, kept in the oral cavity for 2 minutes 2 times a day after brushing teeth. The course included 20 procedures - daily. The clinical effects of the proposed complex are due to an increase in the mineralizing function of oral fluid, the activity of antimicrobial protection and the antioxidant system of the oral cavity. Thus, the protective effect of the therapeutic and prophylactic complex was cumulative, as a result of which the reduction in dental caries by the increase in KPU over 2 years was 51.9%.
Conclusion: The study data indicate the need for measures that will help reduce the growth of caries and generally improve the dental health of the population. As a result of the treatment, a decrease in the growth and reproduction of opportunistic microflora was noted in the oral cavity of the observed children. Clinical effectiveness is confirmed by the dynamics of clinical data, including caries reduction indicators.

P1192

ASSESSMENT OF SARCOPENIC OBESITY BASED ON HANDGRIP STRENGTH AND SARC-F AND RELATED FACTORS IN MIDDLE-AGED AND OLDER INDIVIDUALS WITH DIABETES

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Background: The increasing prevalence of diabetes in aging populations has increased the clinical significance of sarcopenic obesity (SO), a condition characterized by the coexistence of sarcopenia and obesity. This study aims to assess the prevalence of SO using handgrip strength (HGS) and the SARC-F questionnaire in patients with diabetes and explore associated factors.
Methods: We conducted this cross-sectional study on 276 patients with diabetes aged ≥50 years at a tertiary care diabetes outpatient clinic between October 2019 and March 2020. HGS and SARC-F participants were evaluated to identify sarcopenia and body mass index (BMI) for obesity. Clinical and demographic data, including frailty (FRAIL questionnaire), functional status (Katz and Lawton scales), nutritional status (MNA-SF), and depressive mood (GDS-SF) were also recorded.
Results: Men had higher HGS, while women had higher BMI and obesity prevalence. Sarcopenic obesity, identified in 7.4% of participants using the SARC-F questionnaire, was associated with significantly lower HGS, poorer nutritional status, functional decline, higher fall rates, and worse quality of life. Multivariate analysis revealed falls and EQ5-D scores as significant predictors of SARC-F-defined sarcopenic obesity. HGS-based sarcopenic obesity was linked to older age, lower HGS, worse IADL and EQ5-D scores, hypertension, and polypharmacy. HbA1c, hypertension, and EQ5-D scores emerged as significant predictors in logistic regression.
Conclusion: SO significantly impacts functionality, health outcomes, and quality of life. Identifying risk factors such as falls, hypertension, and poor quality of life can guide targeted interventions. Early recognition and management are crucial to mitigate its adverse effects.

P1193

ASSESSING THE APPLICABILITY OF THE MINI SARCOPENIA RISK ASSESSMENT QUESTIONNAIRE IN TURKISH OLDER ADULT POPULATION: A VALIDATION STUDY

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Objectives and Aim: This study aimed to validate the Mini Sarcopenia Risk Assessment(MSRA) Questionnaire in a Turkish older adult population. It aims to establish the applicability of MSRA, specifically its Turkish versions, MSRA-5 and MSRA-7, as effective pre-screening tools for sarcopenia.
Materials and Methods: This study included 267 older adults from geriatric outpatient clinics. The MSRA questionnaire, comprising the MSRA-7 and MSRA-5 variants, was adapted to Turkish following a rigorous translation and cultural tailoring process. The participants' sarcopenia risk was evaluated using these questionnaires, and the results were analyzed for reliability, sensitivity, and specificity. Age, Hand Grip Strength (HGS), Usual Gait Speed (UGS), Appendicular Lean Mass (ALM), Body Mass Index (BMI), and psychological scales. The diagnostic accuracies of the MSRA-7 and MSRA-5 questionnaires were evaluated against multiple sarcopenia benchmarks.
Results: Significant differences were observed between genders in age, HGS, UGS, ALM, BMI and psychological parameters (all $p < 0.05$). The prevalence of sarcopenia varied by diagnostic criteria, with the Turkish BMI cutoff indicating a 24.0 % prevalence compared to a 3.0% prevalence with the height-squared cutoff. Diagnostic accuracy of MSRA tools showed high sensitivity and Negative Predictive Value (NPV) across different standards, with the Turkish BMI and height-squared cutoffs exhibiting notable sensitivity (79.7% and 98.8% NPV respectively) and the FNIH criteria showing high sensitivity (89.2%) and NPV (90.6%).
Conclusion: The Turkish versions of the MSRA-5 and MSRA-7 were validated pre-screening instruments for sarcopenia in older adults in Turkey. They exhibit reliable metric properties and substantial congruence.

P1194

COMPARISON OF DIAGNOSTIC VALUE OF THE SARC-F AND ITS TWO MODIFIED VERSIONS (SARCF-EBM AND SARCF-CALF) IN OLDER ADULTS IN TURKIYE

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Objective
This study aimed to assess the diagnostic value of the SARC-F with SARC-F EBM and SARC-CalF, in identifying sarcopenia among community-dwelling older adults.
Methods
This study included 468 participants aged ≥65 years, recruited from outpatient clinics. The diagnostic tools assessed were the SARC-F, SARC-F EBM(which incorporates BMI and age), and SARC-CalF(which includes calf circumference).
Results
For BMI-based sarcopenia, the SARC-F EBM demonstrated the highest sensitivity (40.0%, 95% CI: 31-49.5) and specificity (80.7%, 95% CI: 76.4-84.6), with an AUC of 0.674(95% CI: 0.617-0.732, p < 0.001). SARC-CalF had a lower sensitivity(17.1%, 95% CI: 10.8-25.1) but a higher specificity(87.1%, 95% CI: 83.3-90.2) and an AUC of 0.574(95% CI: 0.512-0.636, p < 0.001).
Conclusion
The SARC-F EBM demonstrated superior sensitivity and diagnostic accuracy compared to the original SARC-F and SARC-CalF for detecting sarcopenia in older adults.. SARC-CalF, while offering higher specificity, may require refinement for broader clinical use, particularly in male populations.

P1195

PREDICTIVE FACTORS FOR ASSESSING PHYSICAL PERFORMANCE AND FUNCTIONAL RECOVERY FOLLOWING FRAGILITY HIP FRACTURE SURGERY: A PROSPECTIVE COHORT STUDY

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INTRODUCTION:
Fragility hip fracture is a significant burden, causing high morbidity and mortality. Furthermore, the presence of concurrent osteoporotic vertebral compression fractures (OVCFs) can worsen functional outcomes. However, the incidence of combined fractures and their associated factors for short-term and long-term functional outcomes remain largely unknown. This study aimed to identify the associated risk factors for functional outcomes in both the short and long term in patients with fragility hip fractures, both isolated and combined with OVCF.
MATERIALS & METHODS:
A prospective cohort study was conducted from April 2021 to June 2022. Inclusion criteria included patients aged 60 years and older diagnosed with femoral neck fractures or intertrochanteric fractures treated with either bipolar hemiarthroplasty or Proximal Femoral Nail Antirotation (PFNA) fixation. All participants were enrolled in the Fracture Liaison Service care program. The cohort comprised 56 patients (52.3%) in the isolated hip fracture group and 51 patients (47.6%) in the group with combined OVCF. Bone mineral density (BMD) was measured, along with vertebral fracture assessment to evaluate the incidence of combined OVCF at the time of admission. Physical performance was assessed at 2-week and 6-week follow-up using the Timed Up and Go test (TUG), and functional outcome was evaluated using the Harris Hip Score (HHS) at 6 and 12 months. Other risk factors were analyzed using univariate and multivariate regression methods.
RESULTS:
General demographic data showed no significant differences between the isolated hip fracture and combined OVCF groups, including age, gender, body mass index (BMI), comorbidities, ASA classification, nutritional status, fracture type, type of surgery, time to surgery, operative time, estimated blood loss, and length of hospital stay. Two-thirds of this elderly population (63.6%) exhibited vitamin D insufficiency, and a high prevalence of possible sarcopenia (74%) was observed, assessed by low hand grip strength.
BMD at the femoral neck was significantly lower in the combined OVCF group (0.61 ± 0.09 g/cm² vs. 0.66 ± 0.12 g/cm², P = 0.02), as was the T-score at the femoral neck (-2.65 ± 0.67 vs. -2.25 ± 0.88, P = 0.01). However, spinal BMD did not show a significant difference between groups, while trabecular bone score (TBS) was significantly lower in the OVCF group (1.29 ± 0.15 vs. 1.37 ± 0.11, P < 0.01), indicating poorer bone microarchitecture. Furthermore, hip fractures occurred sooner than expected in most patients with osteopenia (59.1%) compared to those with osteoporosis (29.5%).
Contrary to some previous studies, the combined OVCF group did not exhibit significant differences in TUG test scores or HHS compared to the isolated group. However, OVCF significantly affected long-term ambulatory gait aid dependence at 6 months (P = 0.009) and 12 months (P = 0.05).
Multivariable analysis identified several key factors negatively impacting 12-month HHS, including advanced age, longer length of hospitalization, delayed time-to-surgery (over 72 hours), and femoral neck T-score less than -2.5.
CONCLUSION:
While OVCF did not significantly affect early recovery or BMD, it negatively impacted long-term ambulatory status and was associated with poorer bone microarchitecture. Advanced age, delayed surgery, longer length of hospitalization, and femoral neck T-score < -2.5 were significant predictors of long-term outcomes, emphasizing the need for personalized post-operative care and further research.

P1196

ACCURACY OF ARTIFICIAL INTELLIGENCE FOR VERTEBRAL FRACTURE ASSESSMENT BY DXA SCAN

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Background:
Established osteoporosis patients with hip fractures often remain underdiagnosed for osteoporotic vertebral compression fractures (OVCFs). Our hospital's standard of care for assessing hip fracture patients and coexisting OVCFs involves bone mineral density evaluation using dual-energy X-ray absorptiometry (DXA) scans and Vertebral Fracture Assessment (VFA) tools. YOLOv8 (You Only Look Once version 8), a powerful and efficient object detection model, has the potential to detect occult vertebral collapses, graded by the Genant classification, aiding in the early identification of OVCFs.
Purpose:
To design and validate a multi-stage deep learning system for the automated detection, localization, and classification of OVCFs from DXA scans and VFA tools in established osteoporotic patients.
Materials and Methods:
Data from 548 hip fracture patients who presented to our hospital from January 2018 to September 2024 were collected. DXA scan and VFA images of 344 patients were retrospectively evaluated. Spine specialists marked and classified fractures according to the Genant classification (0, 1, 2, 3), considering the upper and lower endplates and the posterior wall. Radiological diagnosis confirmed these classifications. YOLOv8 was employed for vertebral fracture detection. VFA results were categorized into two precision groups: bounding box-based (B) and mask-based (M). Model performance was evaluated using recall, F1-score, mean average precision (mAP50), and mean average precision across IoU (Intersection over Union) values from 50% to 90% (mAP50-95).
Results:
The mean age of the 548 patients (262 female, 286 male) was 79.82 years (SD 8.62 years). Among them, 138 had intertrochanteric fractures, 203 had femoral neck fractures, and 5 had multiple fractures. The DXA scan and VFA images of 344 patients were recruited (138 with intertrochanteric fractures and 203 with femoral neck fractures). Bounding Box-Based Metrics (B) composed of Precision: 0.6635 (66.35% of predictions were correct), Recall: 0.8803 (88.03% of fractures were detected), F1-Score: 0.7567 (average of Precision and Recall), mAP50: 0.9609 (excellent performance in detecting positions at an IoU of 50%), and mAP50-95: 0.6881 (lower accuracy at higher IoU thresholds). Additionally, Mask-Based Metrics (M) composed of Precision: 0.5827 (lower precision compared to bounding box-based metrics), Recall: 0.8399 (83.99% of collapsed areas were detected), F1-Score: 0.6880, mAP50: 0.8937 (good performance), and mAP50-95: 0.5245 (lower accuracy at higher IoU thresholds). The final image shows an overlap of 90% between G1 and 81% between G2.
Conclusion:
The artificial intelligence model can accurately and automatically detect and classify OVCFs in established osteoporotic patients using DXA scans and VFA tools, according to the Genant classification. While the bounding box-based metrics outperformed the mask-based metrics, both demonstrated strong potential for clinical applications.

P1197

DISTRIBUTION AND GENDER-SPECIFIC DIFFERENCES OF CORONAL PLANE ALIGNMENT OF HEALTHY KNEE

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Background: Understanding optimal prosthesis alignment in TKA remains crucial despite ongoing debate. While current research focuses on osteoarthritic knees, a gap exists in characterizing healthy young adult knees in Asians. This study aims to fill this gap by identifying the distribution of coronal plane alignment of the knee (CPAK) phenotypes in this population, including potential gender variations and individual differences.
Methods: A total of 390 knees from 195 young adults aged 20 to 35 years without knee pain who underwent hip knee-ankle radiography were prospectively collected between February 2024 and March 2024. The average medial proximal tibial angle (MPTA), lateral distal femoral angle (LDFA), arithmetic hip knee ankle angle (aHKA), and joint line obliquity (JLO) were measured. The overall CPAK distribution was analyzed to assess gender variations and individual differences. On average, participants were 25.7 years old, 165.7 cm tall, and had a BMI of 23.6 kg/m². LDFA, MPTA, aHKA, and JLO averaged at 86.8°, 87.2°, 0.3°, and 174.0°, respectively.
Result: The participants' demographics are presented in Table 1. The mean age of all participants was 25.7 years. Their average height, body weight, and body mass index (BMI) were 165.7 centimeters (cm), 65.2 kg (kg), and 23.6 kg per square meter (kg/m2), respectively. The average LDFA, MPTA, aHKA, and JLO were 86.8°, 87.2°, 0.3°, and 174.0°, respectively. Knee alignments of all participants were categorized into 9 zones using the CPAK system as shown in Fig. 2. Overall, zone II was the most common (43.3%), with 19.5% and 14.1% in zones III and zone I, respectively, for both the men and women groups. When considering gender, the three most common zones in the men group (Fig. 3) were zone II, III, and I (45.7%, 23.4%, and 20.7%), while in the women group (Fig. 4), they were zone II, V, and III (41.1%, 18.3%, and 15.8%). Considering the individual patient's right and left knees, the specific most common zones differed slightly between sides (p = 0.507). In the right knee group, the most frequent zones were II, III, and V (42.6%, 21.5% and 13.8%), while the left knee group showed zones II, III, and I as the most common (44.1%, 17.4% and

16.9%). There were no differences between right and left knees in men (p = 0.321) and women (0.649). Additionally, comparing participants to their opposite knee (Table 3), there was comparable result (p = 0.895) within the same zone between men and women (56.4% and 55.4%, respectively). Additionally, a comparison of the overall CPAK distribution, CPAK with apex point distal (zone I-III), and CPAK zone V by gender was demonstrated in Table 4, there were significant differences in the overall CPAK distribution (p < 0.001), the CPAK with apex point distal (89.9% vs. 64.9%, p < 0.001), and CPAK zone V (5.9% vs. 18.3%, p < 0.001) between men and women.

Discussion and clinical application: Intra-individual participant similarity and variation in CPAK alignment is an important issue in current practices and considerations in preoperative planning for TKA. Hip and knee reconstruction surgeons typically rely on the alignment of the contralateral knee to inform potential CPAK zone determination for the affected knee undergoing TKA. However, data from this study suggests a significant discrepancy within individual participants. The concordance rate for CPAK type was only 56.4% for men and 55.4% for women. These findings necessitate a more comprehensive approach to preoperative planning for bone cuts during TKA. This approach should integrate three key factors, the CPAK alignment of the affected knee, the CPAK alignment of the contralateral knee, and the most prevalent CPAK type observed in the patient's geographical location. By considering all three factors, surgeons can make a more informed decision regarding bone cut placement during TKA.

Conclusion: This study examined CPAK distribution in young Asian adults without knee osteoarthritis and identified potential sex-based variations. The findings suggest a predominance of distally pointed CPAK (76.9%) and a possible benefit for slightly varus tibial cuts during TKA in this population for optimal joint alignment. Additionally, gender specific considerations should be incorporated into knee alignment assessments and treatment planning.

Table 1 The participants' demographics

Parameters (Mean ± SD)	All	Men	Women	*p*-value
N	195	94	101	
Age (years)	25.7 ± 2.9	25.5 ± 3.0	25.9 ± 2.8	0.119
Height (cm)	165.7 ± 8.8	172.6 ± 5.9	159.3 ± 5.7	**< 0.001**
Weight (kg)	65.2 ± 14.9	72.4 ± 12.5	58.4 ± 13.9	**< 0.001**
BMI (kg/m^2)	23.6 ± 4.7	24.3 ± 4.1	23.0 ± 5.3	**0.006**
MPTA (degree)	87.2 ± 2.3	86.3 ± 2.3	88.0 ± 2.2	**< 0.001**
LDFA (degree)	86.8 ± 2.3	86.3 ± 2.1	87.3 ± 2.2	**< 0.001**
aHKA (degree)	0.4 ± 2.9	-0.1 ± 3.0	0.7 ± 2.7	**0.007**
JLO (degree)	174.0 ± 3.6	172.6 ± 3.3	175.4 ± 3.4	**< 0.001**

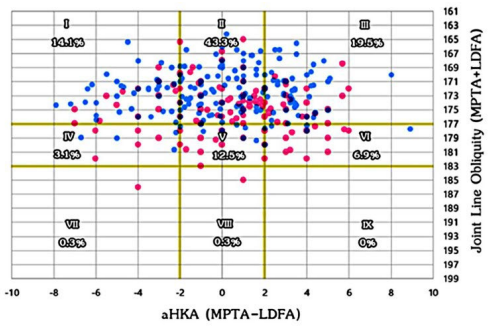

Fig. 2 The overall distribution of coronal plane alignment of the knee (Blue dots are men, pink dots are women, and dark purple dots represent an overlapping data point in both groups)

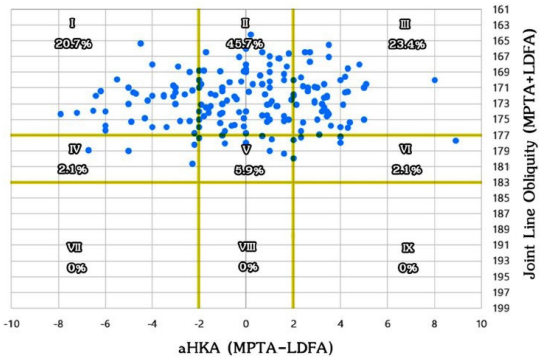

Fig. 3 The distribution of coronal plane alignment of the knee in men

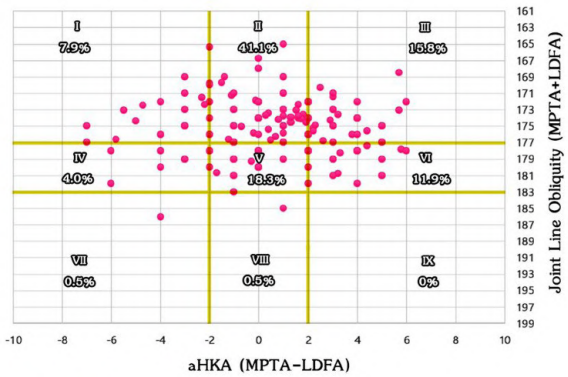

Fig. 4 The distribution of coronal plane alignment of the knee in women

Table 3 Comparison of participants with the same CPAK zone in both knees and different zones in both knees

Gender	Same zone (*N*)	% in zone	Different zone (*N*)	% in zone
Men (*N* = 94)	53	56.4%	41	43.6%
Women (*N* = 101)	56	55.4%	45	44.6%
Total (*N* = 195) *	109	55.9%	86	44.1%

* Define as 195 participants with 390 knees

Table 4 A comparison of CPAK Zone distribution, CPAK with apex point distal (zone I to III), CPAK Zone V, and by gender

Parameters: *n* (%)	All	Men	Women	*p*-value
Overall CPAK distribution				< 0.001
Zone I	55 (14.1%)	39 (20.7%)	16 (7.9%)	
Zone II	169 (43.3%)	86 (45.7%)	83 (41.1%)	
Zone III	76 (19.5%)	44 (23.4%)	32 (15.8%)	
Zone IV	12 (3.1%)	4 (2.1%)	8 (4.0%)	
Zone V	48 (12.3%)	11 (5.9%)	37 (18.3%)	
Zone VI	28 (7.2%)	4 (2.1%)	24 (11.9%)	
Zone VII	1 (0.3%)	0 (0%)	1 (0.5%)	
Zone VIII	1 (0.3%)	0 (0%)	1 (0.5%)	
Zone IX	0 (0%)	0 (0%)	0 (0%)	
CPAK with apex point distal vs. others				**< 0.001**
Zone I-III	300 (76.9%)	169 (89.9%)	131 (64.9%)	
Zone IV-IX	90 (23.1%)	19 (10.1%)	71 (35.1%)	
CPAK zone V vs. others				**< 0.001**
Zone V	48 (12.3%)	11 (5.9%)	37 (18.3%)	
Other Zone	342 (87.7%)	177 (94.1%)	165 (81.7%)	

P1198

ASSOCIATION BETWEEN PAPILLARY THYROID CANCER AND PRIMARY HYPERPARATHYROIDISM

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Introduction: Studies have reported the coexistence of papillary thyroid cancer(PTC) and primary hyperparathyroidism(PHPT) as an incidental finding while pathogenic connections are less understood. **Objective**. We aim to introduce such a case with particular involvement of bone status. **Method:** This is a case report. **Results:** A 73-year-old patient from an iodine-deficient area, known with PHTP due to a left parathyroid adenoma and left-sided PTC, underwent one-time left parathyroidectomy with a left thyroid lobe nodule removal, followed by redo total thyroidectomy and pathological confirmation of multifocal PTC is admitted for re-assessment amid paresthesia in lower limbs. She associates hypertension, NYHA class II heart failure, chronic obstructive pulmonary disease, asthma, obesity, type II diabetes mellitus, vitamin D deficiency, hyperuricemia, and cervical spondylosis with radiculopathy. The family history is significant for hypertension, diabetes mellitus, and psoriasis in the patient's sister and father. Laboratory investigations revealed total serum calcium=8.95mg/dL(Normal:8.4–10.2mg/dL), ionized calcium=4.05mg/dL (Normal:3.8–4.8mg/dL), phosphorus=3.61mg/dL(Normal:2.3–4.7mg/dL), magnesium=2.04 mg/dL(Normal: 1.6–2.55mg/dL), alkaline phosphatase=136U/L(Normal:35–129U/L), CrossLaps=0.62ng/mL(Normal:0.164–0.624ng/mL), osteocalcin=25.92ng/mL(Normal:14–46ng/mL), P1NP=107.5ng/mL(Normal:15–58ng/mL), PTH=56.5pg/mL(Normal:17.3–74.1pg/mL), 25-hydroxyvitamin D=19.4ng/mL(Normal:20–100ng/mL). Thyroid function tests showed TSH=1.18µUI/mL(Normal:0.5–4.5µUI/mL), free T4=16.72pmol/L(Normal:9–19pmol/L), anti-thyroglobulin antibodies=14.1UI/mL(Normal:0–115UI/mL), thyroglobulin=0.04ng/mL(Normal: 3.5–77ng/mL). Dual-energy X-ray absorptiometry(DXA) revealed osteopenia: lumbar spine BMD=0.987 g/cm², T-score=-2.1, Z-score=-2.3; femoral BMD=0.994 g/cm², T-score=-0.6, Z-score=0.2. TBS was 1.262 (partially degraded bone microarchitecture).

Conclusion: Accidental PTC detection during parathyroidectomy adds a supplementary fracture risk by suppressive levothyroxine therapy and long term DXA follow-up is required.

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P1199

DETECTION OF PRIMARY HYPERPARATHYROIDISM AMID SERIAL CHECK-UP FOLLOWING THYROIDECTOMY FOR DIFFERENTIATED THYROID CARCINOMA

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Introduction: Serial check-up after prior thyroidectomy for thyroid cancer (TC) confirmation might allow an early detection of a primary hyperparathyroidism (PHPT) amid newly-identified hypercalcemia. **Objective:**we aimed to introduce such a case. **Method:** This is a clinical report. **Results:** A 78-year-old smoker female patient has a history of hypothyroidism secondary to total thyroidectomy performed for multinodular goitre, whereas a pathological confirmed of a papillary TC was done (and followed by levothyroxine suppressive therapy and radioiodine ablative therapy). During follow-up, she was identified with hypercalcemia and then a PHPT confirmation was done. She underwent a right superior parathyroidectomy with post-operatory normal PTH. Her medical history also includes ischemic stroke, atrial fibrillation, NYHA class III heart failure, and obesity. Currently, the lab findings included a low-normal calcium as total serum calcium=8.3mg/dL(Normal:8.4–10.2mg/dL), ionized calcium=3.8mg/dL (Normal:3.9–4.9mg/dL) and normal phosphorus=4.53mg/dL(Normal:2.3–4.5mg/dL), alkaline phosphatase=93U/L(Normal:38–105U/L), CrossLaps=0.25ng/mL(Normal:0.33–0.782ng/mL), osteocalcin=20.16ng/mL(Normal:15–46ng/mL), PTH=37.11pg/mL(Normal:15–65pg/mL), 25-hydroxyvitamin D=33.9ng/mL(Normal:20–100ng/mL). Thyroid panel showed function suppression and non-detectable levels of serum thyroglobulin. Dual-energy X-ray absorptiometry (DXA) revealed osteopenia: lumbar BMD=0.962 g/cm², T-score=-1.7, Z-score=-1.1; femoral BMD=0.915 g/cm², T-score=-0.9, Z-score=0.4; left forearm BMD=0.868 g/cm², T-score=-0.1 and Z-score=2.5. No fracture was detected at thoracic-lumbar spine X-Ray. Further vitamin D 2000 UI per day was recommended and serial bone health assessment. **Conclusion:** In this instance, smoking, age, levothyroxine suppression therapy and prior history of a parathyroid tumour might represent osteoporotic risk fractures; however, DXA showed osteopenia and a decision of postponing specific medication against osteoporosis was done since no prevalent fractures were detected.

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P1200

CHALLENGES IN MANAGING OSTEOPOROSIS ON A MENOPAUSAL PATIENT WITH METASTATIC, RADIOIODINE-RESISTANT THYROID CARCINOMA ASSOCIATED WITH AN ADRENAL TUMOUR

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Background: Osteoporosis is a multifactorial condition with significant implications for patients with co-existing chronic diseases. Differentiated thyroid carcinoma (TC), particularly in its radioiodine-resistant form (RR), coupled with postmenopausal status, systemic malignancies, and advanced age, represents a high-risk constellation for accelerated bone loss. **Objective**:We aim to introduce such TC, highlighting the interplay of the comorbidities and osteoporosis. **Methods**:This is a case report. **Results**:A 69-year-old woman had a history of papillary TC treated with total thyroidectomy (2016) and radioiodine therapy (2017 - 100mCi, 2021 - 30 mCi, 2023 - 50mCi) with persistently elevated serum thyroglobulin (Tg), refractory to I^{-131} therapy (RR-TC). Imaging assessment revealed pulmonary and lymph node metastases and she is scheduled for tyrosine kinase inhibitors initiation. The patient's comorbidities include a unilateral adrenal tumour of 6 cm with possible (intermittent) autonomous cortisol secretion (the patient declined surgery), and an adrenal myelolipoma. Both menopausal status and TC management (complete thyroidectomy followed by radioiodine therapy, TSH suppression and oncologic medication) represent important risk factors for osteoporosis. Bone health assessment confirmed osteoporosis: (DXA)T-score of -0.8 at total hip, -2.0 at lumbar spine and -3.4 at third distal radius, BMD(g/sqcm) of 0.898, 0,942, respectively, 0,577. Whole body iodine scintigraphy excluded bone metastases. A suppressed TSH(<0.01μIU/mL;Normal:0.35-4.94) under levothyroxine suppression associated low 25-hydroxyvitamin D(16.4 ng/mL;Normal:20-100), and reduced bone turnover markers (P1NP=20.64ng/mL,Normal:20.25-76.31) and normal PTH(23.98pg/mL;Normal:17.3-74.1). The patient has a history of fragility fractures, including a vertebral compression fracture. Zoledronate (4 mg/year) was started alongside calcium (800 mg/day) and vitamin D supplementation (2,000 IU/day). The patient remained under close monitoring to balance the thyroid issues

and skeletal health.**Conclusion:**This case underscores the critical need for a multidisciplinary approach in managing osteoporosis in patients with systemic malignancies, including RR-TC associated with a potential intermittent source of endogenous (mild) cortisol production. Comprehensive strategies, including early diagnosis, targeted osteoporosis treatment, and individualized endocrine-oncologic planning are essential to improve outcomes in high-risk patients.

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P1201

SERUM IRISIN LEVELS IN RELATIONSHIP WITH MINERAL METABOLISM ASSAYS: A CROSS-SECTIONAL ANALYSIS (PROJECT IRI-OP-OB)

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Introduction. Irisin, a new player in the field of bone-metabolic connection acts as a muscle-derivate hormone which is prone to bone forming activity via multiple mechanisms (some of them are still incompletely known so far). Only a few studies address the blood assessment of the circulating levels until present time.
Objective. We aim to analyze the serum irisin profile amid blood assays in menopausal women.
Methods. This was a cross-sectional prospective, bi-centric pilot study. Inclusion criteria were 40 menopausal women (aged over 50) who did not have a prior exposure to specific medication against osteoporosis and signed the informed consent. Exclusion criteria were subjects with active cancers and/or endocrine tumors, and end stage kidney disease. The mineral metabolism was assessed according to three stratum: blood minerals (total calcium and phosphorus), bone hormones [25-hydroxyvitamin D (25OHD) and parathormone (PTH)], and serum bone turnover markers: of formation (P1NP, alkaline phosphatase, and osteocalcin) and of resorption (CrossLaps). Irisine kit was based on ELISA assays. Pearson correlation coefficient was calculated (statistical significance at $p<0.05$). Ethical consent was obtained from both centers (number 32/30.9.24, respectively, 97/20.11.24).
Results. Irisine statistically significant correlated with osteocalcin ($r=-0.338$, $p=0.01$), including after adjustment for body mass index and showed a tendency to correlate with serum phosphate ($r=-0.257$, $p=0.07$), and it did not correlate ($p>0.05$) with patients' age, 25OHD, P1NP, CrossLaps, alkaline phosphatase, and calcemic level.
Conclusion. We emphasize that irisin is one of the key regulatory factors in metabolic-bone interplay and further research might place irisin blood assays amid the panel of fracture risk and bone turnover status evaluation in certain population subgroups. Based on these preliminary data, irisin is associated with blood levels of osteocalcin which is known to connect the metabolism with the bone regulation.
Acknowledgment. This research is part of the project IRI-OP-OB ("Crossroad of metabolism and bone: the impact of irisin, bone turnover and inflammatory markers in patients with menopausal osteoporosis and obesity"): PN-IV-P8-8.3-ROMD-2023-0262.

P1202

BLOOD IRISIN ASSAYS AND GLUCOSE METABOLISM EVALUATION IN MENOPAUSAL SUBJECTS (PROJECT IRI-OP-OB)

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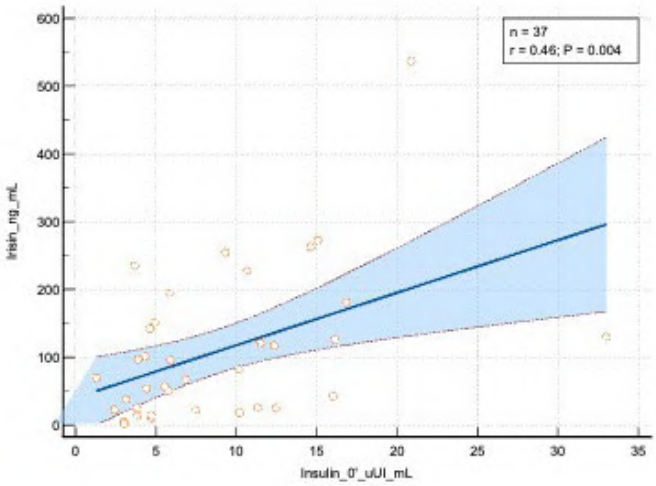
Background: Irisin, muscle product amid cold exposure and physical exercise, seems to be associated with higher bone formation level and insulin sensitivity, particularly, in females. Approximately 70% of circulating levels represent the muscle product, while the rest is secreted by the subcutaneous and visceral adipose tissues. The current clinical studies are limited with respect to circulating irisin and its daily practical applications.
Objective: to evaluate irisin and compare it with glucose profile.
Methods: The study design was a bi-centric, cross-sectional analysis; the assays were performed in 37 menopausal women. We included subjects aged between 50 and 70 years, those who lacked a prior diagnosis of osteoporosis and/or (type 1 or secondary) diabetes and had no prior/current exposure to insulin, GLP-1 agonists or estrogen replacement. We excluded males, individuals with active malignancies (regardless of the applied multimodal management) and those with kidney failure. The study was approved by the Ethical Boards from both centers (32/30.09.2024-Bucharest, 97/20.11.2024-Chisinau) and each patient signed the informed consent. Irisine (ELISA, MyBioSource,ng/mL) was tested a jeun, as well as fasting blood glucose (photomethry,Abbott,mg/dL) and insulin (CLIA,Beckman Coulter,µUI/mL). Correlations were calculated with a cut-off significance at $p<0.05$.
Results:Mean irisin was of 120.958+/-115.823 ng/mL (ranges: 2.07 to 536.93 ng/mL, median of 95.7, with no correlation with the subjects' age). The serum irisin statistically significant correlated with fasting insulin in terms of a positive medium Pearson correlation as shown by $r=0.46$;$p=0.004$, but not with fasting glucose ($r=0.083$,$p=0.8$) Moreover, irisin positively correlated with insulin resistance index (HOMA-IR): $r=0.313$,$p=0.004$ as well as A1c glycated hemoglobin: $r=0.373$,$p=0.008$. Of note, the impairment of glucose profile might be reflected by the levels of serum triglycerides, too, but we did not find a correlation with irisin values ($r=0.129$,$p=0.3$).



Conclusion: These findings in small cohort size are encouraging to further expand the search of testing whether irisin assay might act as marker of metabolism status, including insulin resistance, as reflected by the positive correlation with basal insulin, HOMA-IR, and A1c glycated hemoglobin.

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P1203

OSTEOPENIA IN A PATIENT WIHT SYSTEMIC LUPUS ERYTHEMATOSUS, HYPOTHYROIDISM AND CHRONIC C HEPATITIS COMPLICATED WITH PULMONARY HYPERTENSION

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Background. Bone ailments represents a part of an otherwise complicated panel in systemic lupus erythematosus(SLE). **Objective.** We aimed to introduce a SLE case complicated with low BMD (bone mineral density) and pulmonary hypertension (PH), a rare SLE condition defined by mean pulmonary artery pressure over 20mmHg determined by right heart catheterization(RHC). **Methods.**This was a case report. **Results**. A 72-year-old female with a history of total thyroidectomy for Graves' disease, chronic hepatitis C virus infection and anemia was admitted for weight loss, joint pain, weariness, shortness of breath during moderate exercise, and lower limb swelling. Laboratory tests showed increased inflammation markers:C-reactive protein=30.96mg/L(Normal<5) with leukopenia. She had positive antinuclear antibodies R=5.7, intensely positive anti-double-stranded DNA>200U/mL(Normal<15), and reduced serum total calcium=8.61mg/dL(Normal:8.80-10.6) and 25-hydroxyvitamin D=22.7ng/mL(Normal>30). Cardiac biomarkers showed increased NTproBNP=580pg/mL(Normal<125), with high D-dimers=981ng/mL(Normal<250). SLE was confirmed. Echocardiography revealed minimal left ventricle hypertrophy, mitral and tricuspid valve regurgitation, bi-atrial enlargement, and a high probability of PH. Her symptoms and test results improved after being treated with corticosteroids, loop diuretics, aldosterone antagonists and direct oral anticoagulants that continued with daily 400mg of hydroxychloroquine. Moreover, DXA showed osteopenia: lumbar BMD of 0.932 g/cm^2, T-score -2.1, Z-score -0.7; femoral neck BMD 0.742 g/cm^2, T-score -2.0, Z-score -0.5, total hip BMD 0.713 g/cm^2, T-score -2.4, Z-score -1.1, and reduced TBS=1.291. Additionally, a coronary calcium computed tomography showed an elevated calcium score of 112 AU(reference range:101-400 for moderate evidence of heart disease due to substantial atheromatous infiltration of the proximal left circumflex artery, left anterior descending artery(I-II segments) and right coronary artery(segment II). The patient continued with 2000 U/day cholecalciferol.

Conclusion. This was an unusual case who presented to the rheumatology department with conventional symptoms, but who was actually concealing complex autoimmune illnesses that can have catastrophic and unpredictable effects on the cardiac, respiratory, and even musculoskeletal function. The evaluation of the bone health amid such a complex panel should be performed, as well, at the moment when the clinical status allows it, since factors such as chronic hypoxia, and inflammation, certain thyroid conditions, or chronic glucocorticoids exposure might contribute to the overall increased fracture risk.

P1204

PERSONALIZED STRATEGY AMID SEQUENTIAL THERAPY FOR MENOPAUSAL OSTEOPOROSIS AND PRIOR MULTIMODAL INTERVENTION FOR BREAST CANCER

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Objective: Patients under anti-osteoporotic treatment should be thoroughly evaluated to ensure compliance to the adequate sequence of medication, especially for individuals with long-history

of osteoporosis. We aim to introduce such case. **Method:** case presentation. **Results:** A 73-year-old female has a history of type 2 diabetes and breast carcinoma since the age of 46 (for which she underwent chemotherapy, right mastectomy and 4 years of tamoxifen; at age 48 she also had total hysterectomy with bilateral adnexectomy). At age of 51, the patient was diagnosed with osteoporosis and started ibandronate intravenous (3 mg/3 months). She was poorly compliant for more than one decade, and then Dual-Energy X-Ray Absorptiometry (DXA) showed bone loss [lumbar BMD=0.763g/sqcm,T-score=-2.6; femoral neck BMD=0.654g/sqcm,T-score=-2.3; total hip BMD=0.687g/sqcm,T-score=-2.4]. Denosumab (60 mg twice yearly) was recommended and then self-decided to be stopped 2 years later, whereas DXA was stationary [lumbar BMD=0.907g/sqcm,T-score=-2.3; femoral neck BMD=0.751g/sqcm,T-score=-2.1; total hip BMD=0.680g/sqcm,T-score=-2.6]. Currently, after another 3 years without anti-osteoporotic treatment, while the patient remained fracture-free, DXA-BMD decreased [lumbar BMD=0.810g/sqcm,T-score=-3.3; femoral neck BMD=0.629g/sqcm,T-score=-2.9; total hip BMD=0.637g/sqcm,T-score=-3.0]. Increased bone turnover was confirmed by elevated bone formation markers [osteocalcin=51.03ng/mL(normal:15-46) and P1NP=113.8 ng/mL(14.28-58.92)] and resorption [CrossLaps=1.16ng/mL(0.33-0.782)]. Low TBS of 1.228 confirmed partially degraded microarchitecture. Zoledronate (5 mg/year) was administrated (plus cholecalciferol 2000IU/day). **Conclusion:** Zoledronate might represent an option in poorly compliant patients since it might experience a good outcome in fracture risk reduction upon a single injection from 12 to 36 months, particularly, with additional benefits for breast cancer outcome.

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P1205

LIFE-LONG CONSEQUENCE OF LATE DIAGNOSIS AMID MOSAIC TURNER SYNDROME AND OSTEOPOROSIS

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Objective: Patients with Turner syndrome (TS) are at risk of osteoporosis at young age due to hypogonadism (especially in the absence of hormonal replacement) and other co-morbidities such as celiac disease, vitamin D deficiency, etc. We aim to introduce a patient with mosaic TS firstly diagnosed in her fourth decade of life complicated with osteoporosis. **Method:** case report. **Results:** A 35-year-old female with short stature (-6.28SD) and hypoacusis had spontaneous menarche at 14, 2 spontaneous pregnancies (healthy new-borns) followed by secondary amenorrhea at 23 (no oestrogens or growth hormone therapy). Currently, premature ovarian insufficiency (elevated FSH=84.77mIU/mL), and autoimmune thyroid disease with high-normal TSH are confirmed. Mineral metabolism assays showed normal total serum calcium [9.51mg/dL (normal:8.4-10.3)]; low-normal 25-hydroxyvitamin D [24.3ng/mL (normal>30)]. Increased bone turnover markers [osteocalcin of 64.22ng/mL (normal:11-43), alkaline phosphatase of 116U/L (normal:35-104), P1NP of 118.5ng/mL(normal:15.13-58.59) and CrossLaps of 0.95ng/mL (normal: 0.162-0.487)] and normal parathormone [49.51pg/mL (normal:17.3-74.1)] were identified. Dual-Energy X-Ray Absorptiometry (DXA) confirmed low BMD (bone mineral density) for age for her age: lumbar BMD of 0.921g/sqcm, Z-score of -1.1, femoral neck BMD of 0.569g/sqcm, Z-score of -2.5 and total hip BMD of 0.592g/sqcm, Z-score of -2.5. Cytogenetic analysis showed mosaic karyotype 45,X[31]/46,XX[9], diagnosing 46,XX mosaic TS. Oestrogen-progestative replacement therapy and cholecalciferol 2000IU/day and levothyroxine 50µg/day were started. **Conclusion:** Due to the milder phenotype in mosaic TS, the adequate diagnosis and therapy may be delayed, including a potential impact on fracture risk, life-long surveillance being mandatory especially in poorly compliant individuals.

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P1206

CHALLENGES IN THE MANAGEMENT OF SEVERE MENOPAUSAL OSTEOPOROSIS AMID AROMATASE INHIBITOR THERAPY: IS THERE AN INTERFERENCE OF THE COVID-19 PANDEMIC YEARS INTO ADHERENCE TO MEDICATION?

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Objective: The management of osteoporosis requires a long-term strategy tailored to the patient's individual risk factors, treatment response, and tolerance/adherence to medication. We aim to introduce a senior patient with multiple comorbidities, interruptions in therapy, and breast cancer treatment with aromatase inhibitors. **Method:** case report. **Results:** This was a 90-year-old female patient admitted for bone status assessment. She entered menopause at 50 years old, was diagnosed with osteoporosis at 73 and started bisphosphonates. After 4 years, DXA improved [lumbar bone mineral density(BMD)=0.937g/sqcm, T-score=-2.0; femoral neck BMD=0.837g/sqcm, T-score=-1.4; total hip BMD=0.837, T-score=-1.4]. She had a 3-year drug holiday and then suffered multiple thoracic and lumbar vertebral fractures, thus teriparatide was recommended and stopped after 3 months due to persistent nausea and aggravated depression, thus zoledronate 5 mg/year was administered for 2 years. During COVID-19 pandemic restrictions, she stopped anti-osteoporotic treatment for 3 years. Meanwhile she underwent excision of a left breast invasive carcinoma and started aromatase inhibitor therapy. Currently, after 1 year of letrozole and 3 years without anti-osteoporotic medication, DXA-BMD decreased [lumbar BMD=1.275g/sqcm, T-score=-2.3; femoral neck BMD=0.644g/sqcm, T-score=-2.8; total hip BMD=0.729g/sqcm, T-score=-2.3]. Bone formation markers were normal [osteocalcin=21.76ng/mL(normal:15-46), P1NP=40.7ng/mL(normal:15.13-58.59)] and resorption [CrossLaps= 0.33ng/mL(normal:0.33-0.782)] without incidental fractures. Zoledronate 5 mg/year was administered, with annual follow-up. **Conclusion:** This case emphasizes the need for continuous surveillance of patients with a complex history of anti-osteoporotic treatment and adjustment of therapeutic approach based on each individual's case regarding fracture risk, co-existing diseases and drug options.

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P1207

INTERPLAY OF THE THYROID AND ADRENAL COMORBIDITIES IN ALTERING THE BONE PROFILE AMID MENOPAUSE

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Objective: Multiple osteoporotic risk factors may be co-present in menopause, including Thyroid Stimulating Hormone (TSH) suppressive therapy (TSH-ST) and excessive endogenous cortisol production. We aim to introduce such patient. **Method:** case report. **Results:** A 59-year-old female had a total thyroidectomy 5 years prior for papillary thyroid carcinoma, followed by 100 mCi radioiodine therapy and TSH-ST. She associates obesity, hypertension, impaired glucose tolerance and dyslipidaemia. Thyroid panel confirmed TSH-ST [TSH<0.1mIU/mL(target≤0.1), thyroglobulin=0.06ng/mL(normal:3.5-77) and negative anti-thyroglobulin antibodies]. Due to non-specific bone pain, investigations led to the detection of a left femur bone tumour of 2 cm with benign imaging features at computed tomography (CT). The patient declined biopsy. CT also showed bilateral adrenal tumours of 4.73 cm maximum diameter on the right and negative densities on native CT (adenoma). Basal ACTH was suppressed [2.7pg/mL(normal:7.2-63.3)] and plasma-morning-cortisol after 1-mg-dexamethasone suppression test confirmed mild autonomous cortisol secretion (MACS) [13.9mg/dL(normal:<1.8)]. Bone formation was suppressed [osteocalcin of 11.67ng/mL(normal:15-46)] with normal bone resorption. Dual-Energy X-Ray Absorptiometry (DXA) was normal: lumbar BMD (bone mineral density (BMD)=1.200g/sqcm, T-score=0.0, Z-score=0.0, femoral neck BMD=1.013g/

sqcm, T-score=0.3, Z-score=0.5, total hip BMD=1.098g/sqcm, T-score=0.8, Z-score=0.8. Bone microarchitecture was normal (trabecular bone score of 1.388). Right adrenalectomy was postponed by the patient. Surveillance of metabolic and bone status is mandatory. **Conclusion:** While DXA-BMD and TBS were normal in a pre-diabetic, menopausal female with obesity and reduced bone formation, TSH-ST and MACS are prone for an elevated fracture risk. The co-presence of a benign bone tumour might be incidental.

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P1208

MANAGING RISK FRACTURE IN A CASE OF LOW BODY MASS INDEX AND DEGRADED BONE MICROARCHITECTURE

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Objective: Accelerated weight loss and low body mass index (BMI) is associated with higher bone mineral density(BMD) loss and fracture risk. We aim to introduce such patient. **Method:** case report. **Results:** This was a 72-year-old female admitted for non-specific bone pain. She had 26 years since menopause and decreased BMI of 16kg/sqm, a history of chronic viral hepatitis C treated with interferon and ribavirin for 12 years and chronic autoimmune hypothyroidism. Family history included mother with osteoporosis and femoral neck fracture. Adequate substitution [TSH =3.44mIU/mL(normal: 0.35-4.94)] was confirmed [under levothyroxine 50mg/day] and high anti-thyroperoxidase antibodies[182IU/mL(normal:0-5.61)]. Total serum calcium, phosphorus, 25-hydroxyvitamin D and parathormone were normal. Bone formation marker osteocalcin was 31.78ng/mL(normal:15-46), alkaline phosphatase was 63IU/L(normal:40-150), P1NP was 75.23ng/mL(normal:20.25-76.31) and bone resorption marker CrossLaps was 0.619ng/mL(normal:0.33-0.782). Malabsorption tests (including celiac disease and upper endoscopy) were negative. Dual-Energy X-Ray Absorptiometry (DXA) revealed osteoporosis: lumbar BMD=0.722g/sqcm,T-score=-3.7, Z-score=-1.3; femoral neck BMD=0.685g/sqcm,T-score= -2.5,Z-score= -0.3; total hip BMD=0.671g/sqcm,T-score=-2.7,Z-score=-0.8 Microarchitecture was partially degraded [Trabecular Bone Score (TBS) of 1.233]. She had no prevalent fracture on thoracic-lumbar spine X-Ray. 10-year fracture risk assessment for major osteoporotic fractures was of 13%, respectively, hip fracture of 7.3%, adjusted for TBS of 14%, and 7.5%. The patient declined injectable agents against osteoporosis; hence, risedronate (35 mg/week) was started, in addition to vitamin D supplementation (1000IU of cholecalciferol/day). **Conclusion:** A tailored recommendation of anti-osteoporotic medication should be made according to every patient's individual profile, including taking into consideration the T-score profile, identified risk factors, and compliance.

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P1209

GLUCOCORTICOID-ASSOCIATED BONE LOSS AND MENOPAUSAL OSTEOPOROSIS: TAILORED STRATEGY FOR BISPHOSPHONATES DRUG HOLIDAY

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Objective: Chronic glucocorticoid use is associated with a decrease of bone mineral density (BMD) and increase fracture risk,

especially in menopausal status. We aim to introduce such case. **Method:** case report. **Results:** A 75-year-old female followed a 6-year regime of oral bisphosphonates for severe osteoporosis (complicated with mild lumbar fractures) with Dual-Energy X-Ray Absorptiometry (DXA) showing improved BMD [lumbar BMD=0.921 g/sqcm, T-score=-2.2; femoral neck BMD=0.799 g/sqcm, T-score=-1.7; and total hip BMD=0.799 g/sqcm, T-score=-1.7]. She was then recommended drug holiday. After a period of 5-year drug holiday, she started metilprednisolone (a maximum dose of 32 mg/day) for the past 4 months because of diffuse interstitial lung disease. Currently, total serum calcium, 25-hydroxyvitamin D and parathormone were normal. She had reduced bone formation markers [osteocalcin and alkaline phosphatase of 8.58ng/mL (normal:15-46), respectively, 22.7IU/L (normal:35-104)], and normal P1NP [34.19ng/mL (normal:20.25-76.31)], and bone resorption marker CrossLaps [0.51ng/mL (0.33-0.782)]. A DXA reassessment showed BMD decreased [lumbar BMD of 0.869g/sqcm, T-score of -2.6; femoral neck BMD of 0.708g/sqcm, T-score of -2.4; and total hip BMD of 0.739g/sqcm, T-score of -2.1]. Screening thoracic-lumbar spine X-Ray did not confirm any incidental fractures. Noting the newly onset of the glucocorticoids exposure, despite stationary suppression of some bone turnover markers (BTM), a drug re-initiation was done [intravenous zoledronate 5mg/year] plus cholecalciferol 2000 IU/day. **Conclusion:** The decision of stopping the drug holiday should take into consideration a multimodal panel, including glucocorticoid therapy exposure, prior fractures, and the landscape of blood BTMs.

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P1210

VITAMIN D DEFICIENCY AND BREAST HEMATOMA MASKING A MACROPROLACTINEMIA AND MICROPROLACTINOMA IN A YOUNG ADULT WITH LONG-TERM SECONDARY AMENORRHEA

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Objective: Hyperprolactinemia might imply various etiologies and extensive investigations are sometimes required in order to avoid complications, including osteoporosis. We introduce a patient with hyperprolactinemia that was initially considered caused by a breast hematoma. **Method:** case report. **Results:**A 37-year-old female was admitted for the evaluation of secondary amenorrhea for several years. She recently suffered a chest-wall trauma 10 months prior (car accident), and breast magnetic resonance imaging confirmed a local hematoma. Elevated prolactin [145ng/mL(normal:4.79-23.31)] was found 6 months after trauma. On admission, she had high prolactin [125.6ng/mL(normal:3.34-26.72)], and inappropriately normal FSH [3.29mIU/mL(normal:1.79-5.12)] in amenorrhea. Post-PEG (polyethylene-glycol) precipitation prolactin (110.66ng/mL) confirmed macroprolactinemia and tumour-related prolactin. Pituitary computed tomography showed a hypodense left micro-nodule of 0.33/0.29cm. Mineral metabolism displayed normal calcemic profile, and parathormone, but vitamin D deficiency [5 ng/mL(normal>30)]. Bone turnover markers were normal. Cabergoline [progressively increased doses until 1mg/week) was started with hormonal and imaging follow-up. Vitamin D supplementation was initiated (2000 UI/day cholecalciferol followed by 1000 UI/day after 3 months). No apparent cause of vitamin D was identified. **Conclusion:** Hyperprolactinemia causing low estrogen and amenorrhea may impact the bone health. Thus, it is mandatory to determine the cause and establish an early management. PEG precipitation and imaging techniques are useful tools for selecting the patients that require prolactinoma protocols. Whether Dual-Energy X-Ray Absorptiometry should be performed in a young subject with long-term untreated secondary amenorrhea represents a personalized decision, and, in this instance, the investigation was declined by the patient.

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P1211

THE CONSEQUENCES OF ACROMEGALY AND PREMATURE OVARIAN FAILURE ON BONE HEALTH AND CHALLENGES OF ASSOCIATED MANAGEMENT

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Objective: Acromegaly is associated with deteriorated bone microarchitecture and increased fracture risk, particularly vertebral fractures. Co-existing hypogonadism or diabetes increases the risk factor. We aim to introduce a female with acromegaly and hypogonadism complicated with osteoporosis. **Method:** case report. **Results:** This was a 50-year-old subject was diagnosed with pituitary meso-adenoma-related acromegaly at 31; she underwent trans-sphenoidal hypophysectomy followed by lanreotide PR for 1 year, achieving remission. After 9 years, recurrence was detected in terms of high insulin-like growth factor [IGF1=290ng/mL(normal:73-263)] and growth hormone (GH). Long-acting octreotide 20 mg/month and cabergoline 1 mg/week was started. At 42, she developed secondary amenorrhea (elevated FSH=75.67mIU/mL), confirming premature menopause/ovarian failure. Estro-progestative replacement was offered, but stopped after a few months because of severe headache. Mineral metabolism evaluation showed normal total serum calcium=9.7mg/dL (normal:8.4-10.3), and parathormone=33.55pg/mL(normal:15-65), and a mild vitamin D deficiency [25-hydroxyvitamin D=21.4ng/mL(normal>30)]. Bone formation markers were within normal range [osteocalcin=32.61ng/mL(normal:15-46), alkaline phosphatase=67.7IU/L(normal:35-104) and P1NP=75.5ng/mL(20.25-76.31)], as well as resorption marker CrossLaps=0.55ng/mL(normal:0.33-0.782). Dual-Energy X-Ray Absorptiometry confirmed abnormal results [lumbar bone mineral density (BMD)=0.888g/sqcm, T-score=-2.5, Z-score=-1.7, femoral neck BMD=0.773g/sqcm, T-score=-1.7, Z-score=-0.9, total hip BMD=0.770g/sqcm, T-score=-1.4, Z-score=-1.4. with partially degraded microarchitecture(TBS=1.335). She continued octreotide 20mg/month and cabergoline 0.5mg/week and initiate anti-resorptive treatment with risedronate (35mg/week) and vitamin D supplementation. **Conclusion**: Acromegaly and premature ovarian insufficiency/menopause (in individuals who are not estrogens candidates) act synergistically to alter bone quality and quantity. Long-term surveillance is mandatory since controlling GH and IGF1 excess might not be tidily reflected in the BMD normalization.

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P1213

THE ROAD FROM IV TO SC INFLIXIMAB AND ITS IMPACT ON MUSCULOSKELETAL AND SKIN MANIFESTATIONS IN SYSTEMIC RHEUMATIC DISEASES

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Background: The management of autoimmune rheumatic diseases is under continuous research and evolution. New therapeutic developments enter and cover the remaining open space. Biological agents, in particular anti-TNFα agents led the road of therapeutic developments. The anti-TNF agent infliximab was the first anti-TNF agent to be applied in the treatment of rheumatoid arthritis (RA), ankylosing spondylitis (AS) and psoriatic arthritis (PsA). Thereafter, major developments followed, however infliximab remains one of the most successful biological agents.
Objectives: The aim of the study was to describe the successful application of infliximab in SC administration in patients with RA, AS and PsA.
Methods: In a group of 40 patients, 31 female and 9 male, with RA aged 32-82 years the biological agent infliximab was administered. In a subgroup of 20 RA patients infliximab was initially administered as an induction treatment IV at times 0, 2 and 6 weeks, thereafter as a maintenance regimen 120 mg SC every 2 weeks. In a subgroup of 20 patients with RA infliximab was administered as an induction treatment at a dose of 120 mg SC every week for 5 weeks, thereafter as a maintenance regimen 120 mg SC every 2 weeks. In all patients methotrexate was administered SC at a dose 20 mg/wk. In all RA patients CRP, ESR and DAS28 were measured before treatment and 3 and 6 months later. In 20 patients, 6 female and 14 male, with AS infliximab was administered as an induction treatment IV at a dose of 5mg/kg at times 0, 2 and 6 weeks thereafter every 2 weeks at a dose of 120 mg SC. In AS patients ESR, CRP and BASDAI were measured before treatment, 3 and 6 weeks later. In 20 patients with PsA, 12 female and 8 male, infliximab was administered as an induction treatment at a dose of 5mg/kg IV at times 0, 2 and 6 weeks, thereafter as a maintenance regimen of 120 mg SC every 2 weeks. In PsA patients

methotrexate was administered at a dose of 20mg/wk SC. In PsA patients ESR, CRP and DAPSA were evaluated before treatment, 3 and 6 months later.
Results: In all RA patients a significant improvement in laboratory indices and DAS28 was observed (p<0.001). No significant difference in improvement was noted between the 2 subgroups of RA patients, i.e. the groups with IV and SC induction regimens. In AS patients laboratory indices and BASDAI improved significantly (p<0.001). In PsA patients laboratory indices and DAPSA improved significantly (p<0.001). In all groups musculoskeletal manifestations improved significantly, while in PsA patients skin manifestations improved significantly.
Conclusion: The majority of RA, AS and PsA patients described herein were managed successfully by infliximab in SC administration. The outcome was complete disease remission. It appears that the biological agent infliximab, the first anti-TNFα agent introduced, continues to be a gold standard in the treatment of RA and spondylarthritis.

P1214

PROTECTING PATIENTS WITH SYSTEMIC RHEUMATIC DISEASES AND MUSCULOSKELETAL MANIFESTATIONS FROM HERPES ZOSTER

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Background: Patients with systemic rheumatic diseases present with various musculoskeletal manifestations. Therapeutic management of systemic rheumatic diseases and the respective musculoskeletal manifestations requires the administration of immune modulating agents which may lead to immunosuppression. Infectious diseases may appear such as herpes zoster. In immunocompromised patients herpes zoster may have severe manifestations, including severe or generalized rash, ocular involvement and postherpetic neuralgia. Vaccination against herpes zoster before the administration of immune modulating agents may prevent herpes zoster. A live attenuated vaccine against herpes zoster was developed and was used for some years. However, it was fraught with side effects. Therefore, a recombinant vaccine was developed.
Objectives: Systemic rheumatic diseases are characterized by immune dysregulation. The diseases require the administration of immune modulating agents. Therefore, vaccination against herpes zoster is required before the initiation of immune modulation. The aim was to describe a group of patients with systemic rheumatic diseases and musculoskeletal manifestations who were vaccinated against herpes zoster using the novel recombinant vaccine.
Methods: A group of 80 patients with systemic rheumatic diseases, 40 with rheumatoid arthritis (RA), 15 with ankylosing spondylitis (AS), 15 with psoriatic arthritis (PsA) and 10 with systemic lupus erythematosus (SLE) were vaccinated against herpes zoster with the novel recombinant vaccine before the administration of immune modulating agents. Vaccination was performed in 2 doses.
Results: Vaccination against herpes zoster with the recombinant vaccine was performed in a group patients with systemic rheumatic diseases before the administration of immune modulating agents. Vaccination was not found to have any adverse effects. Only one patient, a female patient with RA developed fever and two patients developed local pain in the site of the performed vaccination which improved a few hours later.
Conclusions: Vaccination against herpes zoster is necessary in systemic rheumatic diseases before the administration of immune modulating treatment. Vaccination with the novel recombinant vaccine was performed without any serious adverse events. Vaccination against herpes zoster using the recombinant vaccine seems to be safe and effective. Further studies are required to prove the necessity and efficacy of vaccination against herpes zoster with the novel recombinant vaccine in patients with systemic rheumatic diseases and musculoskeletal manifestations.

P1215

DEVELOPMENT OF SYSTEMIC LUPUS ERYTHEMATOSUS WITH SEVERE MUSCULOSKELETAL MANIFESTATIONS AFTER SARS-COV-2 INFECTION

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The SARS-CoV-2 virus is an autoimmune virus as it has been shown to induce autoimmunity. Systemic lupus erythematosus (SLE) may be related to various infectious agents. The aim was to describe the onset of SLE with severe musculoskeletal manifestations in a female patient after COVID-19 vaccine and COVID-19 infection.
A female patient, aged 47, had the first and the second dose of the vaccine against Covid-19. Two weeks later she developed a skin eruption affecting the face and the palmar surface of both hands and hair loss. Local treatment with corticosteroids was administered with improvement of the skin eruption. A few months later she developed diffuse musculoskeletal pain. Two years later she had a Covid-19 infection. A month after the infection she had diffuse musculoskeletal pain, arthritis of both knee joints, recurrence of the skin eruption and fatigue. Anti-dsDNA ab were posi-

tive, anti-Ro (+), anti-La (+) and anti-Sm (+). SLE was diagnosed. Hydroxychloroquine was administered without improvement. Azathioprine and belimumab were given without improvement. The patient responded with partial improvement to the administration of prednisolone 15 mg daily.
The case of a female patient is described who developed SLE after SARS-CoV-2 infection. It appears that the SARS-CoV-2 virus is an autoimmune virus and may cause systemic autoimmunity. In the case described herein a mild COVID-19 infection triggered the development of a systemic autoimmune disease with severe musculoskeletal manifestations which responded to the administration of corticosteroids. This case along with others in the literature is compatible with the potential of the SARS-CoV-2 virus to cause systemic autoimmunity.

P1216

COMPARATIVE ANALYSIS OF BONE MICROARCHITECTURE THROUGH 3D-X-RAY DENSITOMETRY BETWEEN WOMEN WITH TYPE 2 DIABETES AND HEALTHY CONTROLS

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Objective: This study evaluates 3D-DXA parameters determining the cortical and trabecular compartments in patients with type 2 diabetes (T2D) compared to non-diabetic subjects, aiming to identify their determinants.
Material and methods: Patients with T2D were diagnosed according to ADA criteria. Anthropometric measurements were performed using WHO standards, and body mass index (BMI) was calculated using the Quetelet method. Bone densitometry (DXA) images were analyzed with 3D Shaper software, which assesses the cortical and trabecular structure of the femur in three dimensions from conventional DXA images. Volumetric bone mineral density (vBMD), bone mineral content (BMC), and volume in various regions of the femur, along with cortical thickness, were calculated. Data analysis was conducted using SPSS 27.0, with comparisons between T2D patients and controls using Student's t-test and ANCOVA, adjusting for age, sex, and BMI.
Results: A total of 125 subjects were recruited: 51 healthy controls and 74 T2D patients (70.3% women), with average ages of 53.9 and 53.6 years, respectively. The average disease duration in the T2D group was 11.4 years. Significant deficiencies in vitamin D levels were found, with 56% in the control group and 64% in the T2D group having levels below 20 ng/ml. No significant differences in aBMD were observed between groups. 3D-DXA analysis showed consistently lower volumetric bone mineral density (vBMD) in T2D patients compared to controls, with significant differences in the trochanter, femoral neck, and average cortical thickness. No significant correlation was found between HbA1c or disease duration and vitamin D levels, but a positive correlation was observed between waist circumference, BMI, and higher bone density in all regions.
Conclusions: This study highlights the potential of 3D-DXA for analyzing bone microarchitecture in T2D patients, revealing differences in cortical and trabecular bone not detectable with conventional aBMD measurements. Women with T2D exhibited lower bone parameters in the trochanter and femoral neck, consistent with research linking long-term T2D and poor glycemic control to compromised bone quality.

P1218

NEOADJUVANT AND ADJUVANT THERAPY FOR TRIPLE-NEGATIVE BREAST CANCER: OPTIMIZING TREATMENT OUTCOMES

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Objective: This study investigates the efficacy of neoadjuvant and adjuvant therapies in triple-negative breast cancer (TNBC) with a focus on improving clinical outcomes and survival rates.
Methods: We conducted a multicenter, randomized controlled trial to evaluate the combination of chemotherapy, immunotherapy, and targeted therapy in TNBC patients. Biomarkers of response and recurrence were monitored using next-generation sequencing and liquid biopsy.
Results: Preliminary findings show a 30% improvement in overall survival (OS) in patients receiving combination therapies versus standard chemotherapy alone. The identification of specific biomarkers correlated with therapeutic efficacy further supports a personalized treatment approach.
Conclusion: Combining novel therapies in the neoadjuvant and adjuvant settings significantly enhances outcomes in TNBC, highlighting the importance of personalized treatment strategies in high-risk populations.

P1219

IMMUNOTHERAPY AND PRECISION MEDICINE IN HER2-POSITIVE BREAST CANCER: A NEW ERA OF TARGETED THERAPIES

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Objective: This study explores the role of immunotherapy in HER2-positive breast cancer, alongside the integration of precision medicine for individualized treatment regimens.
Methods: We performed a retrospective cohort study analyzing patient outcomes from HER2-positive breast cancer trials combining immunotherapy agents such as trastuzumab deruxtecan with targeted therapies. Genomic profiling was conducted to identify potential biomarkers predictive of treatment response.
Results: Our data suggests that the combination of immunotherapy with precision-targeted therapy provides significant improvement in progression-free survival (PFS) and OS, especially in pa-

tients with mutations in the PI3K/AKT pathway.
Conclusion: Precision medicine combined with immunotherapy represents a promising frontier in the management of HER2-positive breast cancer, offering tailored treatment that improves patient outcomes.

P1220

ARTIFICIAL INTELLIGENCE IN CANCER CARE: LEVERAGING MACHINE LEARNING FOR EARLY DETECTION AND TREATMENT OPTIMIZATION

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Objective: This research investigates the role of artificial intelligence (AI) and machine learning (ML) in enhancing early detection and optimizing treatment for various cancers.
Methods: We developed an AI-driven model that integrates clinical, genomic, and imaging data to predict cancer risk, detect early-stage tumors, and recommend personalized treatment protocols. The model was trained using a dataset of 10,000 patient records across multiple cancer types.
Results: The AI model demonstrated a 25% increase in early detection rates, particularly in colorectal and lung cancers, and significantly improved treatment recommendation accuracy.
Conclusion: AI and ML can revolutionize cancer care by providing real-time, data-driven insights for early detection and treatment optimization, thereby improving patient outcomes and survival rates.

P1221

PD1/PD-L1 INHIBITORS IN LUNG CANCER: MECHANISMS OF RESISTANCE AND OVERCOMING THERAPEUTIC LIMITATIONS

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Objective: This study investigates the mechanisms of resistance to PD1/PD-L1 inhibitors in lung cancer and explores strategies to overcome these limitations.
Methods: A cohort of non-small cell lung cancer (NSCLC) patients undergoing PD1/PD-L1 inhibitor therapy was analyzed for resistance markers through tissue biopsy and liquid biopsy. We tested combination therapies with chemotherapy and alternative checkpoint inhibitors.
Results: Resistance to PD1/PD-L1 inhibitors was associated with mutations in the tumor microenvironment and loss of T-cell function. Combination therapy with chemotherapy and dual checkpoint blockade improved patient response rates by 35%.
Conclusion: Targeting resistance mechanisms through combination therapies can enhance the efficacy of PD1/PD-L1 inhibitors in NSCLC, offering new therapeutic avenues for patients who fail first-line immunotherapy.

P1222

CAR-T CELL THERAPY IN HEMATOLOGIC MALIGNANCIES: ADVANCES IN PERSONALIZED IMMUNOTHERAPY

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Objective: To evaluate the potential of CAR-T cell therapy in personalized treatment for hematologic malignancies, including leukemia and lymphoma.
Methods: This phase II clinical trial involved 120 patients with B-cell malignancies who underwent CAR-T cell therapy tailored based on their tumor antigen profile. We analyzed treatment efficacy, safety, and long-term survival outcomes.
Results: CAR-T therapy showed a 60% complete remission rate in relapsed/refractory patients, with minimal adverse events. Personalized modifications to the CAR construct improved patient responses by enhancing T-cell persistence.
Conclusion: Personalized CAR-T cell therapy offers a promising and effective approach for treating hematologic malignancies, with improved patient outcomes and reduced side effects.

P1223

GLOBAL HEALTH DISPARITIES IN CANCER CARE: ADDRESSING GAPS IN ACCESS, EQUITY, AND OUTCOMES

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Objective: To identify and address global disparities in cancer care, focusing on access to treatment, outcomes, and healthcare infrastructure in low-resource settings.
Methods: This global study surveyed 50 low- and middle-income countries, collecting data on healthcare access, treatment outcomes, and the burden of cancer. We analyzed the impact of telemedicine, mobile health, and international partnerships in improving care delivery.
Results: The study revealed that disparities in cancer care access significantly impacted patient survival rates. Telemedicine interventions led to a 40% increase in diagnosis and treatment adherence in remote areas.
Conclusion: Global strategies that include telemedicine, international collaborations, and infrastructure development can significantly reduce disparities in cancer care and improve patient outcomes in underserved regions.

P1224

NEXT-GENERATION MOLECULARLY TARGETED THERAPIES IN COLORECTAL CANCER: PRECISION MEDICINE APPROACHES

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Objective: This research explores the role of next-generation molecularly targeted therapies in colorectal cancer (CRC), with a focus on precision medicine.
Methods: A cohort of 250 CRC patients underwent molecular profiling to identify novel biomarkers associated with treatment response. We tested targeted therapies against mutations in the KRAS, BRAF, and EGFR pathways.
Results: The use of targeted therapies based on molecular profiling resulted in a 50% improvement in response rates for patients with BRAF-mutated CRC. The identification of novel biomarkers in the tumor microenvironment further enhanced treatment personalization.
Conclusion: Precision medicine approaches, incorporating advanced molecular diagnostics, can significantly improve the efficacy of targeted therapies in CRC, offering more effective treatment options for patients.

P1225

RADIOPHARMACEUTICALS IN ONCOLOGY: REVOLUTIONIZING TARGETED CANCER THERAPY WITH PRECISION RADIATION

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Objective: To evaluate the role of radiopharmaceuticals in providing targeted radiation therapy for various cancers, with an emphasis on personalized treatment.
Methods: This study examined the use of novel radiopharmaceutical agents in prostate cancer, neuroendocrine tumors, and thyroid cancer. We assessed efficacy, toxicity, and tumor response using PET scans and patient outcomes over 12 months.
Results: Radiopharmaceuticals demonstrated a high degree of specificity in targeting tumor cells, resulting in a 40% increase in tumor shrinkage without significant off-target effects.
Conclusion: Radiopharmaceuticals are poised to revolutionize cancer treatment by offering highly targeted therapies with reduced toxicity, improving both treatment efficacy and patient quality of life.

P1226

SYMPTOM MANAGEMENT IN PEDIATRIC CANCER: INNOVATIVE APPROACHES TO PALLIATIVE CARE AND QUALITY OF LIFE

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Objective: To explore novel approaches in symptom management and palliative care for pediatric cancer patients, emphasizing quality of life and family-centered care.
Methods: A multi-center study focused on pediatric patients with advanced cancer was conducted, assessing pain management, psychological support, and family involvement. Innovative palliative care models were implemented, including integrative medicine and home-based care options.
Results: The implementation of innovative palliative care strategies resulted in a 50% reduction in symptom burden and a 25% increase in overall family satisfaction with care.
Conclusion: Enhanced symptom management and palliative care strategies are essential for improving the quality of life in pediatric cancer patients, with a family-centered approach offering significant benefits in both clinical and emotional outcomes.

P1227

FUNCTIONAL OUTCOMES OF PATIENTS WITH OSGOOD-SCHLATTER DISEASE TREATED WITH OPEN REDUCTION AND SCREW FIXATION OF THE TIBIAL TUBERCLE: A AMBIDIRECTIONAL COHORT STUDY

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Background: Osgood-Schlatter disease (OSD) is a common cause of anterior knee pain in adolescents, often resolving with conservative management. However, some cases are refractory and require surgical intervention. Open reduction and screw fixation of the tibial tubercle have been utilized to address persistent pain and instability, but data on long-term functional outcomes remain limited.
Objective: This study aims to evaluate the functional outcomes of patients with OSD who underwent open reduction and screw fixation of the tibial tubercle. Specifically, we assess postoperative pain, knee function, range of motion (ROM), surgical complications, return to sports, and overall quality of life.
Methods: This ambidirectional cohort study includes patients diagnosed with OSD who underwent surgical fixation at Jose B. Lingad Memorial General Hospital. Preoperative and postoperative assessments include pain levels (Visual Analog Scale), knee function (Kujala Anterior Knee Pain Scale and Knee Injury and Osteoarthritis Outcome Score), ROM, and quality of life (SF-36). Patients were followed up at 6 weeks, 3 months, 6 months, 12 months, and annually thereafter. Descriptive statistics, paired

t-tests, chi-square tests, and regression models were used for data analysis.
Results: The study aims to provide comprehensive data on the efficacy and safety of surgical intervention for OSD. Preliminary findings suggest significant improvement in knee function and pain reduction postoperatively, with minimal complications. Further analysis will determine predictors of optimal recovery and long-term patient satisfaction.
Conclusion: This study provides valuable insights into the role of surgical fixation in managing refractory OSD. By evaluating functional outcomes and recovery patterns, we aim to contribute to the optimization of treatment strategies for adolescent patients suffering from persistent OSD symptoms.

P1228

THE ADDED VALUE OF DISTAL RADIUS BONE MINERAL DENSITY FOR THE DIAGNOSIS OF OSTEOPOROSIS IN PATIENTS WITH A HISTORY OF FRAGILITY FRACTURE

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Background: Preventing osteoporotic fragility fractures is a critical health priority, yet there is limited data on the utility of distal radius bone mineral density (BMD) for this purpose. This study aimed to evaluate the added value of distal radius BMD in osteoporosis diagnosis in patients with a history of fragility fractures.
Methods: In a retrospective analysis of prospectively collected data, 1205 who were enrolled in the Fracture Liaison Service of our institute were included in the analysis. The main outcome was the BMD classification of patients using a 3-region BMD (femoral neck, lumbar spine, and distal radius) compared to the conventional 2-region BMD (femoral neck and lumbar spine). The lowest T-score from any skeletal site was used to classify patients into normal, osteopenia, or osteoporosis categories.
Results: Using a 2-region BMD, normal, osteopenia, and osteoporosis were identified in 11.1%, 42.7%, and 46.2% of patients, respectively. After adding distal radius BMD, normal, osteopenia and osteoporosis were detected in 5.6%, 32.9%, and 61.6% of patients, respectively. Two-region and 3-region BMD were discordant in 185 patients. A significant moderate correlation was observed between the distal radius and lumbar spine T-scores (r=0.470, P<0.001). No significant correlation was observed between the distal radius and femoral neck T-scores (r=-0.020, P=0.48).
Conclusion: The addition of distal radius densitometry to the conventional BMD regions can result in earlier diagnosis and treatment initiation in patients with a high risk of fragility fracture.
Keywords: Bone mineral density, distal radius, fragility fracture

P1229

EFFECT OF PARATHYROIDECTOMY ON BONE TURNOVER MARKERS AND BMD OF SYMPTOMATIC AND ASYMPTOMATIC PATIENTS WITH PRIMARY HYPERPARATHYROIDISM: PROSPECTIVE FOLLOW UP STUDY FROM A TERTIARY CARE CENTRE IN NORTH INDIA

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Objective: To study the effect of parathyroidectomy on Bone mineral density (BMD) and serum collagen C-telopeptide (CTx) in symptomatic and asymptomatic patients with primary hyperparathyroidism(PHPT).
Methods: Prospective follow-up study conducted at a tertiary care centre in North India. Consecutive patients with PHPT undergoing parathyroidectomy were included in the study. All biochemical parameters, serum CTx and BMD at hip, forearm and lumbar spine (with DXA scan, GE Lunar) were evaluated at baseline and again at 3 months post parathyroidectomy. Study was approved by institutional ethics committee.
Results: Total of 84 patients underwent parathyroidectomy. Following exclusion of 6 patients, 78 (M = 31, F= 47) were included in the final analysis. Mean±SD age was 50.36 ± 14.83 years. 34 patients (43.5%) were asymptomatic. Mean serum phosphorus level was significantly lower and mean serum PTH level was significantly higher among symptomatic patients as compared with asymptomatic group. There was no statistically significant difference between 2 groups in other parameters. Post surgery, Significant decline in S.CTx levels was seen in both symptomatic and asymptomatic groups. In total study participants, there was a 64% decrease in serum CTx levels post-surgery (320.1 ± 293.8 pg/ml) compared to pre-surgery levels (889.3 ± 508.3 pg/ml). Similarly, serum calcium, iPTH, and urine calcium-creatinine ratio were significantly lower at 3 months post-surgery as compared to pre-surgery level. The proportion of osteoporosis and osteopenia at baseline among study participants were 50% and 37.14% respectively. There was a significant gain in lumbar spine BMD (5.1%) and left femur BMD (5.8%) post-surgery, however, there was no significant change in forearm BMD. Symptomatic PHPT patients showed greater BMD gains at lumbar spine compared to asymptomatic patients (6.12% vs 3.03 %, p<0.05).
Conclusions: A significant decline in Serum CTx levels and gain in BMD at lumbar spine was seen as early as 3 months post parathyroidectomy in both symptomatic and asymptomatic PHPT patients with significantly greater gain in lumbar spine BMD in symptomatic group.

P1230

BREAKTHROUGH ROBOTIC-ASSISTED INTERVENTIONS FOR OSTEOPOROTIC VERTEBRAL FRACTURE MANAGEMENT

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Osteoporotic spinal (OSF) and vertebral compression fracture (OVCF) are common complications occurring during everyday routines, such as reaching, twisting, coughing, and sneezing. They are closely linked to advancing age and may cause long-term disabilities and progressive deformities, exerting a tremendous burden on society. Their treatment can be conservative or surgical. Recently robotic-assisted techniques have shown promising results in improving the outcome of such interventions.

A systematic review in PubMed using keywords including ('robot assisted' or robotic or 'programmable robot') and (fracture or 'fragility fracture' or 'osteoporosis' or 'bone loss' or 'vertebral fracture') and (('spinal surgery' or vertebroplasty) or (exoskeleton or orthoses or brace)) illustrated a picture of recent advancements in the field.

Multiple studies indicated that robot-assisted minimally invasive surgery (R-MIS), as well as percutaneous-vertebroplasty (R-PVP) and kyphoplasty (R-PKP) can substantially decrease OSF/OVCF complications, especially in complex fractures. All offer advantages such as higher accuracy, better dexterity, enhanced visualization of the fracture site, shorter operation times, minimized radiation exposure for the surgeon, and a more effective learning curve for medical professionals caring for osteoporosis patients. Improved screw placement is recognized as a critical factor determining success of the surgical procedure.

Exoskeletons are robots, designed to support their fragile bones during and after surgery, to help patients move and recover. They improve the precision of surgical procedures, provide passive assistance and actively enhance human movements during rehabilitation. Flexible, versatile spinal exoskeletons are shown to overcome the weaknesses and complications commonly connected with traditional braces, improving efficiency, while providing more intensive patient training, better quantitative feedback, and eventually improved overall functional outcomes.

It was also shown that coupling radiomics and biomechanical modeling with either robotic-assisted surgery or the design of cutting-edge robotic exoskeleton technologies exhibits superiority regarding restoration of vertebrae and melioration of functional outcomes by providing personalized details of affected vertebrae.

P1231

AI-ENABLED BONE RADIOMICS, A MORE EFFICIENT TOOL FOR OSTEOPOROSIS/FRACTURE SCREENING

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Radiomics, a rapidly evolving field in medical imaging, is commonly used in the context of clinical oncology; several studies, however, have shown its potential for bone health assessment. To study its efficacy, a systematic search in PubMed using keywords including (osteoporosis, bone mineral/density/mass/loss, fragility/osteoporotic fracture) AND (radiomic(s)) was performed. The search identified 90 articles, 60 of which were relevant.

These studies revealed the radiomics-based approaches extract a large number of textural features from medical images (radiography (digital or conventional), dual-energy x-ray absorptiometry (DXA), computed tomography (CT), and magnetic resonance imaging (MRI)) using data-characterization algorithms. As a result, they offer advantages such as potential for opportunistic screening using existing imaging studies and the ability to capture complex patterns and biometric data of bone microarchitecture, determining bone modifications related to subjects' sex and age. Compared with current diagnostic techniques (DXA and bone turnover markers), these quantitative approaches are shown to have improved diagnostic accuracy.

Incorporating the radiomics score and clinical risk factors (for instance through FRAX), known as a clinical-radiomic model, was also shown to improve fragility fractures prediction considerably. In another approach the image-derived features were combined with various machine learning algorithms, aiming to build more accurate diagnostic, prognostic, and predictive models. Deep radiomics models, benefiting from deep learning algorithms, were shown to have the highest diagnostic performance for both osteoporosis and fracture screening.

It could be concluded that the use of bone radiomic signature in low-dose routine CT can be the future of precision medicine for osteoporosis management. The implementation of such methods into the clinical workflow can be used as an adjunct for opportunistic screening for osteoporosis and fragility fracture with higher accuracy. Our plan is to couple the resulted signature with novel robotic solutions to provide personalized care and revolutionize fracture management and improve recovery in these patients.

P1232

ENHANCING SURGICAL OUTCOMES WITH ROBOTIC-ASSISTED KNEE SURGERY IN OSTEOPOROTIC PATIENTS

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Patients undergoing knee replacement often have concurrent osteoporosis, resulting in postoperative complications such as periprosthetic fractures. This is mainly because reduced bone mass can impair osseointegration of the implant, raising the risk of aseptic loosening. It also renders the structures more vulnerable to prosthesis misalignment, leading to abnormal stress and strain.

The ongoing transformation in robotic-assisted knee replacement surgeries has shown benefits such as minimal invasion, higher precision, accuracy, and surgeon control, and reduced recovery time.

We conducted a systematic search in Google Scholar and PubMed utilizing keywords i.e 'Osteoporosis,' 'Robotic Surgery,' 'Total Knee Arthroplasty (TKA),' 'Robot-Assisted Surgery,' and 'fracture,' while restricting the results to FDA-approved methods, to identify the optimal options in osteoporotic patients.

According to the literature, i) Teleoperated, ii) Autonomous, and iii) Semi-autonomous Robotic Systems can be used for this purpose.

Teleoperated Systems like da Vinci Surgical Systems have showcased versatility in soft tissue surgery, with limited applications in rigid bone knee surgeries.

The ROBODOC, a pioneering Autonomous Robotic system, offers accurate placement of bone implants compared to conventional methods. It competed with CASPER, which was discontinued due to an increased rate of postoperative complications.

Semi-autonomous Robotic Systems (MAKO, ACROBAT, and NAVIO) have gained traction by allowing greater control. ACROBAT system, designed for unicompartmental knee arthroplasty, enables high-precision bone cutting. Underlying osteoporosis, however, worsens abnormal stress and strain distributions during this surgery, increasing the risk of postoperative osteoarthritis progression. NAVIO uses a probe to map out the knee anatomy during surgery, providing higher precision. MAKO is an image-based robotic system that allows real-time implantation and alignment adjustments. This can help with real-time tracking, positioning, and alignment of the prosthesis during surgery, lowering the stress rate on the joint. It, therefore, seems to be the method of choice in reducing the risk of future osteoporosis-related complications in TKA.

P1233

PREDICTING OF RADIOGRAPHIC PROGRESSION IN RHEUMATOID ARTHRITIS

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The aim: to find the predictors of erosion score dynamics reflecting progression in patients with rheumatoid arthritis with long-term follow-up.

Materials and methods: 151 women with rheumatoid arthritis (RA) (ACR 1987, EULAR/ACR 2010) were included in an open-label, prospective, cohort study, the average age was 63.6 ± 9.2 years, RA duration at baseline 14.3 ± 9.8, who underwent an outpatient or inpatient examination in 2010-2014 (follow-up duration was 9.7 ± 1.7 years). At baseline and in dynamics there were performed a generally accepted clinical examination, X-ray of hands and feet in direct projection (with Sharp/Van der Heide assessment), DEXA of L1-L4, hip neck and total hip; immunological analysis of ACCP (cyclic citrullinated peptide antibodies), RF (rheumatoid factor), CRP (C-reactive protein), IL-6 (Interleukin 6), MMP-3 (Matrix metalloproteinase-3) as well as osteoimmunological markers (osteocalcin, osteoprotegerin, RANKL (Receptor activator of NF-κB ligand), CTX-1 (C-telopeptide of crosslinked collagen type I), BAP (Bone alkaline phosphatase)) were determined.

Results: During the period the group showed a significant ($p < 0.0001$) increase in erosion count: 10.5 [1.0; 38.0] vs 16.0 [3.0; 55.0] Me [25%; 75%]. An increase in erosion count was observed in 64 patients, while stabilization of this indicator was observed in 59 people. When comparing these groups of patients (with increase (group 1) or stabilization of erosion count (group 2) over the study period), it was found that in group 1 patients were significantly more often positive for the RF and ACCP: 51 (80%) vs 29 (49%) ($p = 0.008$) and 50 (78%) vs 36 (61%) ($p = 0.03$), respectively. The ACCP level in dynamics in group 1 was higher than in group 2: 186.1 [17.5; 300.0] vs 33.9 [7.1; 160.8] ($p = 0.02$). Also at baseline, patients in group 1 had higher levels of MMP-3 and IL-6 than in group 2: 55.5 [19.8; 119.5] vs 23.8 [12.9; 67.2] ng/mL ($p = 0.01$) - for MMP-3 and 7.4 [2.6; 21,3] vs 6,1 [0,4; 10.1] pg/mL ($p = 0.02$) - for IL-6. The delta (Δ, %) of BMD in hip neck and total hip was lower ($p<0.05$) in group 1 (M: -11.5 vs -5.2 and -9.0 vs -2.1) as well as BMD of hip neck and total hip was lower in group 1, than in group 2 ($p<0.05$). Correlation analysis also revealed a valid association between delta of erosion count and studied parameters. The discriminant analysis revealed the following variables: MMP-3 and IL-6 levels at baseline, RF level in dynamics, ΔBMD and BMD in dynamics of hip neck – that formed the formula for predicting the high risk of radiological progression in a patient with RA. The area under the ROC curve (AUC) is 0.777, 95% CI (0.674-0.881), sensitivity - 62%, specificity - 73%.

Conclusions: The analysis of the results of long-term observation of patients with RA showed that higher levels of MMP-3 and IL-6 at baseline, RF level in dynamics, lower ΔBMD and BMD in dynamics of hip neck are associated with an increase in erosion count.

P1234

DETERMINATION OF THE ROLE OF IL-6R GENOTYPE IN THE DEVELOPMENT OF LOCAL BONE LOSS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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The aim: to evaluate whether functional single nucleotide polymorphism (SNP) rs2228145 in the IL-6 receptor (IL6R) gene could predict a local bone loss in patients with RA.
Materials and methods: 151 women with rheumatoid arthritis (RA) (ACR 1987, EULAR/ACR 2010) were included in an open-label, prospective, cohort study, the average age was 63.6 ± 9.2 years, RA duration at baseline 14.3 ± 9.8, who underwent an outpatient or inpatient examination in 2010-2014 (follow-up duration was 9.7 ± 1.7 years). At baseline and in dynamics there were performed a generally accepted clinical examination, X-ray of hands and feet in direct projection (with Sharp/Van der Heide assessment); immunological analysis of ACCP (cyclic citrullinated peptide antibodies), RF (rheumatoid factor), CRP (C-reactive protein), IL-6 (Interleukin 6), MMP-3 (matrix metalloproteinase-3) as well as osteoimmunological markers (osteocalcin, osteoprotegerin, RANKL (receptor activator of NF-κB ligand), CTX-1 (C-telopeptide of crosslinked collagen type I), BAP (bone alkaline phosphatase)) were determined. Genomic DNA was automatically extracted from peripheral whole-blood samples of 141 patients. SNP rs2228145 (Asp358Ala) were analyzed by real-time PCR.
Results: As expected from the allele frequency population-based studies (European population), we found that the wild-type (A) was more frequent than the mutated allele (C) of the SNP rs2228145: A/A (38,3%), A/C (47,5%), C/C (14,2%). At baseline and in dynamics the AA carriers for rs2228145 had 1 X-ray stage of RA more often than patients carrying the C allele (AC+CC): 13% vs 3% (p=0.03) and 9% vs 0% (p=0.016) respectively. In dynamics the C allele carriers more often had stage 3-4 than those with the AA genotype (p=0.01). An erosion count at baseline and in dynamics was significantly greater in patients carrying the C allele (AC+CC) than AA: 16,0 [2,0; 47,5] vs 5,0 [0; 19,5] (p=0.01) and 27,0 [5,25; 62,0] vs 12,0 [2,0; 42,5] (p=0.04) respectively. Also, it was found that the RANKL level above normal in dynamics was more often in CC carriers than in patients carrying the A allele (AA+AC): 30% vs 7% (p=0.01). As for the other immunological and osteoimmunological markers studied, no statistically significant associations were found.
Conclusions: In this study, we found an association between rs2228145 and the radiological progression (the development of local bone loss) in patients with RA. Our results suggest that patients carrying CC genotype and minor (mutated) C allele present greater local bone loss, which is expressed in X-ray stage, erosion count and indirectly in RANKL level.

P1235

VERTEBRAL AND PERIPHERAL BONE FRACTURES IN PATIENTS WITH RHEUMATOID ARTHRITIS (BASED ON LONG-TERM FOLLOW-UP DATA)

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Objective: In rheumatoid arthritis (RA) fractures occur on average 2-3 times more often than in the population. Information on the frequency of vertebral fractures in RA is contradictory and depends on the method by which they were determined.
Aim: To determine the incidence of vertebral fractures and peripheral bones in patients with RA with long-term prospective observation.
Materials and methods: A prospective multi-year cohort non-interventional study included 120 women with RA (mean age at inclusion 54.3 ± 8.9 years), the duration of follow-up was 9.5 ± 1.9 years. Initially and in dynamics, a clinical and X-ray examination were performed (X-ray morphometry of the spine according to the Genant method, X-ray absorptiometry of the lumbar spine (L1-L4) and femoral neck (FN)).
Results: During the follow-up period, 104 low-energy fractures occurred in 64 (53%) patients: 69 (66%) vertebral fractures and 35 (34%) peripheral fractures. Two or more fractures occurred in 25 (39%) patients. In 30 (25%) patients 52 fractures occurred again. Among peripheral fractures the most frequent localization was fractures of the distal forearm and lower leg bones. Patients who suffered fractures during the follow-up period were more likely to have fractures before entering the study; had an initially longer duration of RA (Me 14,0 vs 10,0 p=0.001); an average daily dose, cumulative dose – at baseline and in dynamics (p<0.05) and duration of GC administration (Me 133 vs 43, p=0.008) and lower bone mineral density in L1-L4 and hip at baseline and in dynamics (p<0.05). There was no effect of RA activity (DAS-28), RF or ACCP positivity on fractures. The diagnosis of osteoporosis (OP) was established in 83 (69%) patients at baseline and in 95 (79%) in dynamics. All patients with OP were recommended anti-osteoporotic treatment (bisphosphonates or denosumab). 94% of patients stated that they followed the recommendations for the treatment of OP, among which 36% of patients received treatment for more than 3 years continuously. The rest took anti-osteoporotic drugs in intermittent courses with the whole mean duration of anti-OP therapy during follow-up for 43 months (3.5 years).
Conclusions: More than a half of the patients had low-energy fractures during the observational period, among which fractures of the vertebrae, distal forearm and lower leg bones predominated; there was a high frequency of repeated fractures. Analysis of risk factors showed that a long duration of RA, an average daily/cumulative dose and duration of GC administration, a history of low-energy fractures, and low BMD are associated with the occurrence of fractures in patients with RA. The adherence to anti-OP therapy was estimated to be low.

P1236

NEW INSIGHTS INTO OSTEOGENESIS IMPERFECTA: IDENTIFICATION OF NOVEL GLYCINE-SUBSTITUTING MUTATIONS

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Objective: The study aims to explore the genetic and clinical features of patients diagnosed with *osteogenesis imperfecta* (OI), with a focus on identifying novel missense mutations affecting glycine residues in collagen-coding genes. These findings are intended to advance the understanding of OI pathogenesis and improve diagnostic and therapeutic strategies.
Material and Methods: A cohort of 92 Belarusian patients diagnosed with OI was recruited, including 55 children and 37 adults. Comprehensive clinical assessments were performed, including anamnesis, physical examinations, laboratory tests, molecular genetic analyses, and dual-energy X-ray absorptiometry (DXA). The sequencing methodology was based on a custom AmpliSeq research panel, optimized for the Illumina MiSeq platform. Variant filtering for pathogenicity followed ACMG guidelines and was supported by bioinformatics tools ANNOVAR, SIFT, and PolyPhen-2.
Results: The analysis identified 87 pathogenic or likely pathogenic variants, including 24 novel missense mutations affecting glycine residues in *COL1A1* and *COL1A2*. Among these, key mutations such as p.Gly238Val, p.Gly325Asp, and p.Gly493Cys in *COL1A1*, as well as p.Gly221Ser, p.Gly565Val, and p.Gly717Ala in *COL1A2*, were found to disrupt the triple-helical domain, leading to severe clinical phenotypes (Figure).

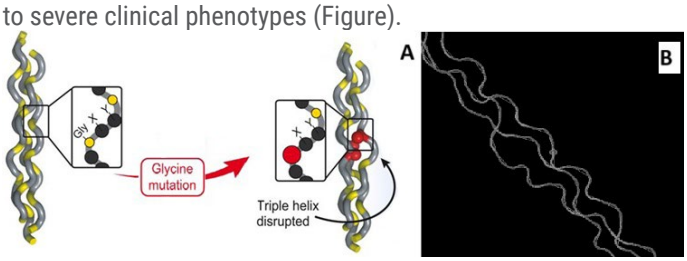

Figure. A. Schematic representation of a missense mutation of glycine in the triple helix of collagen, leading to a change in its structure and function. B. Novel mutation c.G662A of the COL1A1 gene, affecting the protein structure through the amino acid substitution p.G221D (PolyPhen 2, the position of SNV is indicated by a circle)
The revealed mutations were associated with frequent fractures, significant skeletal deformities, and extra-skeletal manifestations such as hearing loss and dentinogenesis imperfecta. Functional annotation confirmed their impact on collagen stability.
Conclusion: This study underscores the critical role of glycine residues in collagen stability and their impact on the clinical severity of OI. The identification of 24 novel glycine-substituting missense mutations expands the mutational spectrum of *COL1A1* and *COL1A2* and highlights their diagnostic relevance. These findings emphasize the importance of genetic testing in OI care.

P1237

HANDGRIP STRENGTH AND BONE HEALTH IN YOUNG CHILDREN: A POPULATION-BASED PROSPECTIVE BIRTH COHORT STUDY

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Objective: Higher levels of grip strength have been associated with greater bone health, but evidence is mostly in adolescence and early adulthood and often cross-sectional, so we aimed to evaluate the longitudinal relationship between grip strength and bone health in young children.
Materials and Methods: This study analysed data from the Southampton Women's Survey, a population-based prospective birth cohort in the UK initiated in 1998. Handgrip strength (kg) was measured using a Jamar handgrip dynamometer and averaged over three attempts for each hand and a total body less head area-adjusted bone mineral content (aBMC) was assessed using dual-energy X-ray absorptiometry (DXA) at ages 4 (n = 990), 6 (n = 443), and 8 years (n = 972). Associations were examined using linear mixed-effects models for aBMC with an interaction term for grip strength (measured longitudinally) and age, and adjusted for sex, birthweight, and socio-economic status.
Results: Grip strength had a positive association with aBMC at baseline (4 years of age) such that those with 1kg higher grip strength had 2.6 g greater aBMC (CI (0.9, 4.3)). Additionally, higher grip strength was associated with a higher rate of growth of aBMC over time (interaction term 0.5 g, *p-value* < 0.001). That is, for every 1kg greater grip strength at any timepoint, the rate of growth of aBMC per year at that time was increased by 0.5 g/year. For example, those with grip strength at the 25th percentile had an increase of aBMC of 62.2 g/year, while those with grip strength at the 75th percentile had an increase of 65.5 g/year.
Conclusion: Grip strength was positively associated with baseline bone health and its growth throughout childhood across the follow-up period of this study, contributing to growing evidence supporting the potential benefits of muscle strength for bone health in childhood.

P1238

THE GUT MICROBIOME IN EARLY LIFE AND BONE HEALTH AT 6 YEARS: FINDINGS FROM A DANISH BIRTH COHORT STUDY

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Objective: The gut microbiome is associated with bone health in animals and adult humans, but longitudinal evidence in childhood is lacking, so we aimed to investigate the association between the gut microbiome and later bone health in childhood.
Materials and Methods: We used data from the Copenhagen Prospective Studies on Asthma in Childhood$_{2010}$ study, an ongoing population-based mother-child cohort study in Denmark. Infant gut microbiome was measured at 1-week (n = 445), 1-month (n = 492), 1 (n = 509), 4 (n = 350), and 6-years (n = 327) by 16S rRNA sequencing (V4 region). Total body less head (TBLH) bone mineral density (BMD) and area-adjusted bone mineral content (aBMC) were measured by dual-energy x-ray absorptiometry (DXA) at age six. Gut microbiome characteristics were assessed based on α-diversity (within-sample) and relative abundance, by multiple linear regression and β-diversity (between-sample) by permutational multivariate analysis of variance. Differential abundance was assessed by stratifying bone outcomes into tertiles.
Results: Higher α-diversity at 1 year was associated with lower BMD (β = -1.8x10^{-3} CI [-3.4x10^{-3}, -1.5x10^{-4}]) and at 4 years to lower BMD (β = -1.4x10^{-3} CI [2.7x10^{-3}, -7.7x10^{-5}]) and aBMC (β = -1.8 CI [-3.2, -0.4]). β-diversity at 6 years was associated with BMD (F = 1.9, *p* = 0.026). No associations with α/β-diversity were observed for other ages. After adjustment for multiple testing, *Escherichia-Shigella* in 1-month olds was 1.7-fold more abundant for children in the low compared to high BMD tertile (Log Fold Change = -1.7; *adjusted p-value* = 0.038). Additionally, for every unit increase in *Sutterella* abundance in 1-year-olds, aBMC was 2.2 g lower (CI [-3.4, -1.0]). No other taxa were significantly associated with bone health outcomes at age six.
Conclusion: While we observed some associations, our study does not suggest the early life gut microbiome to be a major contributor to bone health at age six.

P1239

DIFFERENT MUSCLE STRENGTH AND QUALITY ADAPTATIONS AFTER 12 WEEKS OF HIGH INTENSITY INTERVAL TRAINING COMBINED WITH CITRULLINE SUPPLEMENTATION IN MALE AND FEMALE OBESE OLDER ADULTS

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Introduction: Normal aging is associated with decreased muscle mass and strength (S) and increased fat mass that affect health. Among effective strategies to prevent this phenomenon, physical activity and nutritional interventions are widely known, especially in older adults (OA). In our previous research (PMID:35257499), a 12-week High-Intensity Interval Training (HIIT) combined with citrulline (CIT) supplementation enhance the health status of obese OA. However, it remains unclear if these health benefits are sex-dependent. We aim to assess sex differences in muscle and biological adaptations following a 12-week intervention combining HIIT with CIT in obese OA.
Methods: A 12-week HIIT intervention (3 times/week) was realized by eighty-one obese OA, combined with either a citrulline [HIIT-CIT: n=45 (men=20, women=25)] or a placebo [HIIT-PLA: n=36 (men=18, women=18)] supplementation. Body composition (DXA/QPCT), absolute muscle S (AMS) and muscle quality (AMS relative to body mass or specific lean mass) were compared pre (T0) and post (T12) intervention (3-way-anova with repeated measures).
Results: We observed sex-divergent health adaptations following the intervention. In women, handgrip (HG) S decreased (-12%, p<0.01) whereas in men it increased (+43%, p<0.001). Relative HGS to body mass still increased (+34%, p<001) in men but was not affected in women. There was no effect in relative HGS to arm lean mass. HIIT-CIT women exhibited a higher increase (+15%, p<0.001) in leg extension S (N; HIIT-CIT: T0=277±64 - T12=320±70 vs. HIIT-PLA: T0=272±62 - T12=270±55; p<0.05) than HIIT-CIT men (+11%, p<0.05). The same result was observed in leg extension S relative to body weight. but only HIIT-CIT women exhibited a higher significant increase in leg extension S relative to leg lean mass (N.kg^{-1}; HIIT-CIT: T0=9.4±2.2 - T12=10.6±1.9 vs. HIIT-PLA: T0=9.6±2.0 - T12=9.6±1.7; p<0.05).
Conclusion: Although previous research has concluded that HIIT-CIT is beneficial for obese OA, it appears that women and men don't adapt in the same way. This raises the question of how to consider strength to determine sarcopenia and sarcopenic obesity: should we use absolute strength or muscle quality? These findings underscore the importance of assessing sex differences in adaptations to address specific recommendations.

P1240

5-YEAR RISK FRACTURE ASSESSMENT IN PATIENTS AFFECTED BY MASTOCYTOSIS BY THE USE OF REMS TECHNOLOGY

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Objective(s): One of the most common manifestations of mastocytosis is bone structure deterioration, which is often linked to either neoplastic mast cell infiltration or, more likely, the local release of mediators like histamine.[1] According to literature, around 70% of individuals [2] with mastocytosis experience bone damage, with high incidence of fractures.[3] As a result, these patients require regular monitoring of bone mineral density (BMD) and timely treatments. Given the elevated risk of bone-related issues in mastocytosis, early detection of osteoporosis is crucial. This study aims to explore the relationship between mastocytosis and bone health by using REMS technology to assess the imminent fracture risk in mastocytosis patients (MPs).

Material and Methods: The imminent five year Fracture risk has been assessed by combining the REMS T-score with the REMS Fragility Score. Specifically, seven distinct risk categories are established, ranging from the lowest (R1) to the highest (R7).

Results: Femoral REMS-BMD and Fragility score measurements were performed on 47 MPs, aged 40 to 89, with an average BMI of 25 kg/m^2. As expected, they were classified into the high-risk categories R5-R7, indicating a higher probability of experiencing a fragility fracture at a major skeletal site within the next five years.

Conclusion(s): The integration of REMS technology into routine clinical practice for MPs can play a pivotal role in proactively managing bone health. By early identifying individuals at higher risk of fractures, timely interventions can be implemented to prevent fractures and improve the overall quality of life for these patients.

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P1241

DETERMINANTS OF ANTI-OSTEOPOROSIS MEDICATION PRESCRIPTION BY ORTHOPEDIC SURGEONS FOLLOWING HIP FRACTURE IN THAILAND

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Objective: To identify the factors influencing orthopedic surgeons' decisions to prescribe anti-osteoporosis medication (AOM) following hip fractures in Thailand.

Materials and Methods: We conducted a cross-sectional study among orthopedic surgeons who treat hip fractures. Using a model integrating the Technology Acceptance Model and the Theory of Planned Behavior, an online self-administered questionnaire was designed to assess perceived usefulness, perceived ease of use, perceived behavioral control, subjective norms, attitudes toward use, self-efficacy, and the intention to prescribe AOM after hip fractures. The questionnaire was validated by osteoporosis specialists and distributed purposively. Using Krejcie and Morgan's formula, the required sample size was 250. Data were analyzed using structural equation modeling (SEM) with a significance level set at p-value<0.05.

Results: A total of 262 surgeons from all parts of Thailand participated. SEM revealed that attitude toward use (β=0.617, p<0.01) and self-efficacy (β=0.201, p<0.01) were significant predictors of the intention to prescribe AOM. Perceived usefulness and subjective norms not only directly influenced attitudes toward use (β=0.427 and 0.232, p<0.01), they also indirectly predicted the intention to prescribe (β=0.263 and 0.143, p<0.01). However, perceived ease of use and perceived behavioral control did not have significant effects on AOM prescription.

Conclusions: This is the first study incorporating behavioral science to offer new insights into factors influencing AOM prescription. In addition to recognizing AOM's benefits in reducing fractures, surgeons' confidence in prescribing and social influences significantly impact prescribing decisions. Strategies should focus on highlighting AOM's practical advantages, strengthening surgeons' prescribing confidence, and leveraging external incentives—such as institutional guidelines, reimbursement programs, and regulatory support—to promote AOM prescription.

P1243

RELATIONSHIP BETWEEN OSTEOPOROSIS AND FRAILTY IN ELDERLY PATIENTS WITH RHEUMATOID ARTHRITIS

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OBJECTIVE

Osteoporosis and frailty are two conditions commonly seen in the elderly. This study aims to evaluate the relationship between osteoporosis and frailty in elderly patients with rheumatoid arthritis (RA).

MATERIAL AND METHODS

Ninety-nine RA patients aged 65 years and older, without active arthritis and with low DAS28 levels, were included in this cross-sectional study. Osteoporosis was diagnosed using DEXA (T-score ≤-2.5). Sociodemographic characteristics, frailty status (assessed via the KIHON checklist), and nutritional status (assessed via MNA-SF) were recorded. Body mass index (BMI) categories were defined as <25 (underweight), 25–30 (normal), and >30 (overweight/obese). Logistic regression analysis was performed to identify independent predictors of osteoporosis.

RESULTS

The mean age of participants was 72.4 ± 6.7 years, and 83.8% were female. Osteoporosis prevalence was 54.5%. Education level, frailty status, and BMI categories were significantly associated with osteoporosis (respectively, p <0.001, p = 0.042 and p = 0.034). Lower education level and frailty were at higher risk for osteoporosis (OR = 4.689, 95% CI: 1.358–16.189, p = 0.015). Additionally, a BMI <25 was associated with a higher risk of osteoporosis (OR = 4.149, 95% CI: 0.954–18.039, p = 0.058).

CONCLUSIONS

This study highlights the importance of education level, frailty, and BMI as significant factors associated with osteoporosis in elderly patients with RA. In particular, studies investigating the relationship between osteoporosis and frailty in RA patients aged 65 years and older are very limited in the literature. This ongoing study aims to contribute significantly to addressing this gap and enhancing understanding of osteoporosis in this vulnerable population.

P1244

PREVALENCE AND RISK FACTORS FOR OSTEOPOROSIS IN RHEUMATOID ARTHRITIS - INSIGHTS FROM EMERGING REMS TECHNOLOGY

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Objective: Rheumatoid Arthritis (RA) is a chronic autoimmune/inflammatory disease associated with increased osteoporosis (OP) risk, driven by chronic inflammation, glucocorticoid use, and disease-related factors. Radiofrequency Echographic Multi Spectrometry (REMS) is an emerging ultrasound-based, non-ionizing technology for assessing bone mineral density (BMD) and fracture risk, offering a radiation-free alternative to dual-energy X-ray absorptiometry (DXA). The aim was to determine the prevalence and risk factors for OP using REMS in RA patients.

Materials/Methods: A cross-sectional study in a cohort of RA patients. Demographic and clinical data from medical records were included. BMD was evaluated using REMS in the spine and hip, considering factors such as age, sex, disease duration, and glucocorticoid treatment. Logistic regression analysis identified factors associated with OP.

Results: Were included 1,601 RA patients, 78.8% diagnosed with OP. Patients with OP were older (mean: 72.07, SD: 8.36 vs. 63.64, SD: 9.27; p < 0.001), and predominantly female (93.8% vs. 81.6%; p < 0.001). Disease duration was longer in the OP group (mean: 16.85 years, SD: 11.85 vs. 13.09 years, SD: 10.02; p < 0.001). Hypertension (HT) and cardiovascular disease (CVD) were more common in OP patients (HT: 41.6% vs. 30.0%; p < 0.001; CVD: 43.0% vs. 30.5%; p < 0.001). Independent risk factors for OP included age (OR: 1.10, 95% CI: 1.08–1.12; p < 0.001) and female sex (OR: 0.30, 95% CI: 0.20–0.41; p < 0.001). While disease duration, HT, and CVD were significant in univariate analysis, they did not retain significance in the multivariate model. No correlation with glucocorticoid use or RA disease activity.

Conclusions: The prevalence of OP in RA patients is very high, highlighting the need for continuous BMD monitoring. REMS technology represents an emerging, effective, and accessible alternative for OP diagnosis/monitoring in this population without radiation exposure.

P1245

PREVALENCE AND RISK FACTORS FOR OSTEOPOROSIS IN SYSTEMIC LUPUS ERYTHEMATOSUS - INSIGHTS FROM EMERGING REMS TECHNOLOGY

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Objective: Systemic Lupus Erythematosus (SLE) is a chronic autoimmune disease associated with increased osteoporosis (OP) risk, driven by chronic inflammation, glucocorticoid use, and disease-related factors. Radiofrequency Echographic Multi Spectrometry (REMS) is an emerging ultrasound-based, non-ionizing technology for assessing bone mineral density (BMD) and fracture risk, offering a radiation-free alternative to dual-energy X-ray absorptiometry (DXA). The aim was to determine the prevalence and risk factors for OP using REMS in SLE patients.
Materials/Methods: A cross-sectional study was conducted in a cohort of 385 SLE patients. Demographic and clinical data were retrieved from medical records, including age, sex, treatment modality (biological vs. conventional therapy), and glucocorticoid use. BMD was assessed using REMS at the lumbar spine and hip, stratifying patients into normal BMD, osteopenia, osteoporosis, and severe osteoporosis. Logistic regression analysis identified factors associated with OP.
Results: The study included 385 SLE patients; they were predominantly female (85.7%). The prevalence of OP was 41.3%, mainly associated with older age (OR 1.14, 95% CI 1.10–1.17, $p < 0.001$) and female sex (OR 2.29, 95% CI 1.23–4.49, $p = 0.015$). No statistically significant association was observed with glucocorticoid use (OR 1.30, 95% CI 0.85–2.01, $p = 0.230$) or therapy type (OR 1.53, 95% CI 0.72–3.47, $p = 0.289$). No correlation with another sociodemographic or clinical factors.
Conclusion: The prevalence of OP in SLE patients is high, especially among older women. REMS offers a safe, portable, and radiation-free alternative for OP diagnosis and monitoring. These features make REMS a valuable tool for optimizing osteoporosis management in SLE patients, particularly in resource-limited settings, and for those with limited mobility.

P1247

SERUM VITAMIN D DEFICIENCY AND ASSOCIATED FACTORS IN PATIENTS WITH ACUTE AND CHRONIC LOW BACK PAIN AT TAM ANH GENERAL HOSPITAL : A CROSS-SECTIONAL DESCRIPTIVE STUDY

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Introduction: Low back pain (LBP) is a worldwide medical problem. Vitamin D deficiency has been pinpointed to be involved in many chronic disorders. Low back pain (LBP) is a common medical problem worldwide, and vitamin D deficiency has been pinpointed to be involved in many chronic disorders. However, the serum Vitamin D levels in patients with acute and chronic low back pain in Vietnam remain understudied.
Objective: The aim of this study is to describe the situation of Vitamin D deficiency and evaluate the association between serum concentration of 25-hydroxyvitamin D3 and symptoms of adults in Hanoi, Vietnam, suffering from chronic or acute low back pain.
Material and Methods: This prospective observational study used data from the Rheumatology Department, Tam Anh General Hospital in Hanoi. Database on 220 patients diagnosed with chronic or acute low-back pain between January 1, 2023, and January 1, 2024.
Results: **1.** The average serum concentration of 25-hydroxyvitamin D3 of 220 patients was **31,57 ± 16,94** ng/ml. The Vitamin D deficiency ratio of low back pain patients was **54,09%. 2.** There are significant differences between the level of serum Vitamin D with factors: VAS score, smoking, and bone mineral density.
Conclusions: The Vitamin D deficiency rate of low back pain patients was **54,09%** and related to VAS score, smoking, and bone mineral density
Keywords: Vitamin D deficiency, Chronic, and Acute low back pain.

P1248

PREDICTION OF BONE FRACTURE PROBABILITY BY FRAX MODEL IN CHRONIC KYDNEY DISEASE PATIENTS NOT YET ON DIALYSIS IN BACH MAI HOSPITAL : A RETROSPECTIVE STUDY

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Introduction: Fractures caused by osteoporosis have become a major issue in the healthcare community, especially in Chronic Kidney Disease (CKD). The FRAX model (Fracture Risk Assessment in next 10 years) developed by the World Health Organization (WHO), is being widely used in many countries.
Objective: Describe the bone mineral density (BMD) and the fracture risk by the FRAX model of CKD Patients not yet on dialysis in

Bach Mai Hospital, Hanoi, Vietnam

Material and Methods: A retrospective descriptive study included CKD Patients (Diagnostic criteria by KDIGO – Kidney Disease Improving Global Outcomes) who had not been on dialysis in 2 years from 2018 to 2020. Data collection was performed using a database from GE Lunar Hologic bone densitometry equipment in Bach Mai Hospital, and fracture risk was calculated using the FRAX model. Statistical analysis was performed using SPSS software version 2.0.

Results: Sixty-five CKD patients were included (34 females, 31 males). The average age was 52 years [40-85 years], and the mean body mass index was 21.6, diagnosed CKD (40% of grade IV, 35.4% of Grade V, and other grades). The average bone mineral density (BMD) was 0,884 ± 0,2 g/cm2 in the spine and 0,721 ± 0,1 g/cm2 in the total femur. The osteoporosis ratio of this group is 24.6%. A statistically significant osteoporosis ratio with the ages above 60 and increasing PTH serum ($p< 0.05$). The average FRAX was 3,17 % for the probability of major fracture and 1,11 % for hip fracture. The 10,8% of this patient group had high risk of the next 10 years hip fracture, according to the FRAX model (FRAX hip ≥3%)

Conclusions: 24.6% of CKD patients not yet on dialysis were diagnosed with osteoporosis, and 10.8% were at high risk of hip fracture within the next 10 years based on the FRAX model.

Keywords: *Osteoporosis, FRAX, chronic kidney disease*

P1249

EXPERIENCE WITH TREATMENT OF SEVERE OSTEOPOROSIS WITH ROMOSOZUMAB IN SLOVAKIA

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The treatment with romosozumab (ROMO) for patients with severe postmenopausal osteoporosis has been available in Slovakia since May 1, 2024. The first patient was educated at our facility NEDU Ľubochňa on May 2, 2024, and simultaneously received the first dose of ROMO. Experience with ROMO treatment in Slovakia is still modest, but indirect indicators of laboratory parameters are very encouraging. Patient satisfaction with the administered treatment is exceptionally good, with compliance nearly 100% due to the active management by the nursing staff.

Covered treatment with ROMO in Slovakia can be indicated for patients in two scenarios: a) severe postmenopausal osteoporosis in women (with a densitometrically determined T-score of less than -2.5 in the femoral neck, total hip area, or lumbar spine) and with multiple vertebral fractures (two or more fractures), where a vertebral fracture is defined as a reduction in the anterior height of the vertebral body by more than 20% compared to the normal height of the vertebral body; b) severe postmenopausal osteoporosis in women (with a densitometrically determined T-score of less than -2.5 in the femoral neck, total hip area, or lumbar spine) in whom previous anti-resorptive treatment has failed: 1. if they suffered an osteoporotic fracture after at least two years of anti-resorptive treatment, 2. if there was a significant decrease in bone density in the femoral neck (≥ 6%) after two years of anti-resorptive treatment. Covered treatment can only be indicated and prescribed in five selected osteocenters. Covered treatment is limited to one treatment cycle, which lasts a maximum of 12 months. A condition for covered treatment is its continuity and the simultaneous administration of an adequate amount of vitamin D and calcium, typically at a dose of 1000 mg, unless the patient has hypercalcemia.

P1250

NURSING GUIDELINE ON FRACTURE PREVENTION AND OSTEOPOROSIS CARE IN DUTCH COMMUNITY AND PRIMARY CARE: A WORLDWIDE FIRST

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Aims

Fractures (especially in spine, hip and wrist) cause pain and might lead to disability and need for nursing care. In community and primary care settings, over 18,000 nurses and nurse practitioners care for patients with potentially increased fracture risk and osteoporosis in whom fractures can be prevented by timely risk identification and preventive measures. Therefore, a clear nursing clinical practice guideline (CPG) was developed to address fracture prevention in community and primary care.

Methods

Within a governmentally funded program, the Dutch Nursing Association (V&VN) assembled a guideline panel, with representatives from different nursing specialisms, nurse practitioners, general practice, internal medicine, and patient representatives. This panel was led by an independent guideline methodologist and presided by a process lead. As a starting point, this panel focused on topics deemed important in a national survey [1] among nursing professionals working in community and primary care. Furthermore, the guideline panel developed evidence-based recommendations (using the GRADE approach and according to AGREE-II) for nursing professionals, in line with existing national multidisciplinary guidelines [2,3]. The draft guideline was sent out for consultation and pilot implementation and was with minor ad-

justments authorized by all stakeholders.

Results

The pilot implementation showed that the CPG provided guidance in fracture prevention. The CPG includes recommendations for patients after a recent fracture, with increased fracture risk, and patients treated with glucocorticoids. The recommendations on preventive measures include risk assessment, education and counseling, exercise, nutrition and supplements, sleep, adherence and fall prevention. The CPG emphasizes analyzing patient`s preferences and restrictions regarding nutrition and exercise and addresses medication compliance in patients taking anti-osteoporosis medications.

Conclusions

Nurses and nurse practitioners in community and primary health care meet patients with increased fracture risk daily. They fulfill pivotal observational roles in early detection, prevention (of falls and fractures) and providing tailor-made guidance on nutrition, exercise and therapy compliance. This nursing guideline contributes to optimizing care for patients with increased risk of osteoporotic fractures, with the aim to prevent fractures and optimize quality of life. To our best knowledgeIn our opinion, this is the first community nursing guideline for Fracture Prevention and Osteoporosis worldwide aiming at primary as well as secondary fracture prevention in community care.

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P1251

THE NERVE-BONE AXIS: MENDELIAN RANDOMIZATION IDENTIFIES A CAUSAL RELATIONSHIP BETWEEN HEART RATE VARIABILITY AND BONE MINERAL DENSITY

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Background

Mounting evidence suggests a potential role for nerve-bone axis in the regulation of skeletal metabolism. Consequently, our study employed Mendelian randomization (MR) analysis to explore the influence of the autonomic nervous system (ANS) on bone mineral density (BMD).

Methods

We used heart rate variability (HRV) to represent ANS activity in the MR analysis. Initially, we employed a two-sample MR approach to evaluate the causal impact of HRV on BMD. Subsequently, we utilized an additional mediation analysis to assess the influence of circulating metabolites on the observed associations. Finally, we conducted reverse MR analyses to further explore these relationships. To ensure the reliability of our results, we also performed sensitivity analyses.

Results

Genetic liability to standard deviation of the normal-to-normal inter beat intervals (SDNN) (odds ratio [OR]=1.10, 95%CI=1.05~1.15, P<0.001), the root mean square of the successive differences of inter beat intervals (RMSSD) (OR=1.08, 95%CI=1.04~1.13, P<0.001) and peak-valley respiratory sinus arrhythmia or high frequency power (pvRSA/HF) (OR=1.06, 95%CI=1.03~1.09, P<0.001) were positively associated with BMD. And their associations were independent of circulating metabolites. The results of reverse MR analyses indicated no substantial reverse causal relationships. Furthermore, sensitivity analyses reinforced the validity of our causal interpretations.

Conclusion

In summary, the present research supports a genetic correlation between ANS and BMD, which reinforces the concept of nerve-bone axis. Notably, the unidirectional interplay between ANS function and BMD was found to be independent of circulating metabolites. Additional mechanistic and clinical investigations are required to corroborate our findings.

Keywords Heart rate variability, autonomic nervous system, bone mineral density, Mendelian randomization

P1252

THE GUT-NERVE-BONE AXIS: MENDELIAN RANDOMIZATION IDENTIFIES THE RELATIONSHIP BETWEEN GUT MICROBIOTA AND THE NERVE-BONE AXIS

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Background

Mounting evidence suggests that the nerve-bone axis and gut-bone axis may act in the regulation of skeletal metabolism. Consequently, our study uses Mendelian randomization (MR) analysis to explore the existence of the gut-nerve-bone axis.

Methods

Genetic variants associated with gut microbiota were extracted from the MiBioGen consortium. Summary statistics for bone mineral density (BMD) were derived from a UK Biobank genome-wide association study dataset. We used heart rate variability (HRV) to represent the activity of autonomic nervous system (ANS) in the MR analysis. Initially, we employed a two-sample MR approach to evaluate the causal impact of gut microbiota on BMD. Subsequently, we used an additional mediation analysis to assess the effect of HRV on these associations, and sensitivity analysis was used to ensure the reliability of our results.

Results
Coprococcus 2 (β=0.03, 95% confidence interval, CI: 0.00 to 0.05, *P*=0.02), *Lachnospiraceae* NC2004 (β=0.01, 95%CI: 0.00 to 0.03, *P*<0.05), and another 11 genetically predicted taxa exhibited correlations with BMD. Among three types of HRV, pvRSA/HF and RMSSD were both associated with gut microbiota and BMD. The effect of *Lachnospiraceae* NC2004 on BMD occurs through RMSSD with a mediated proportion of 40.0% (95%CI: 21.1 to 58.9%, *P*=0.03) of the total effect. Sensitivity analyses reinforced the validity of our causal interpretations.
Conclusion
In summary, the present research supports a genetic correlation among gut microbiota, ANS, and BMD, which reinforces the concept of a gut-nerve-bone axis. Notably, the interplay between gut microbiota and BMD may be mediated by ANS. Additional mechanistic and clinical investigations are required to corroborate our findings.
Keywords Gut microbiota, autonomic nervous system, bone mineral density, heart rate variability, Mendelian randomization

P1253

PROXIMAL FEMUR BIOMECHANICS: A COMPARATIVE STUDY OF PROPHYLAXIS WIRING AND NON-WIRING IN HIP ARTHROPLASTY

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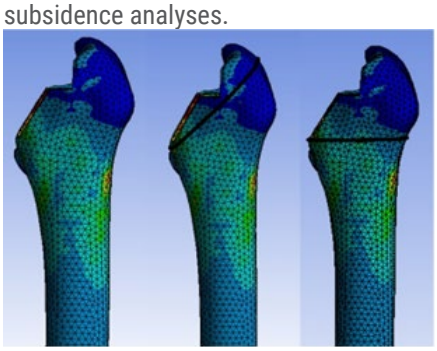
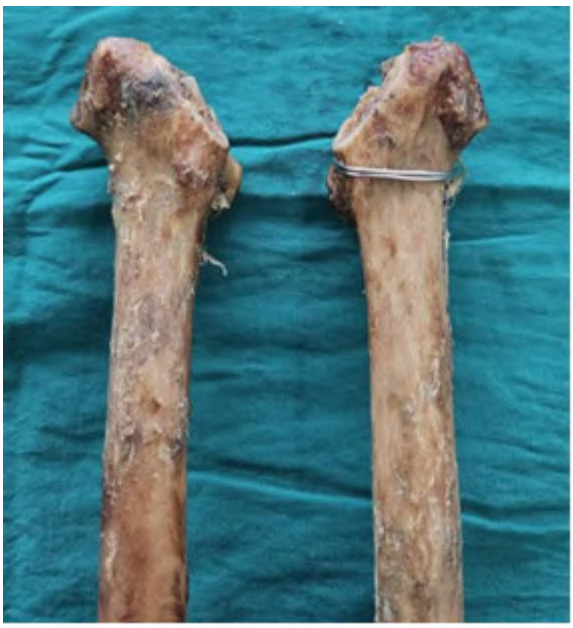
Objective
Intraoperative periprosthetic femur fracture presents a significant complication during total hip arthroplasty, demanding prompt recognition for optimal patient outcomes. This study aims to investigate proximal femur biomechanics and compare failure loads between prophylactic wiring and non-wiring techniques.
Material and Methods
Using Ansys, a finite element model was developed to assess biomechanical differences in the area and technique of wiring, identifying the strongest area and optimal wiring technique. Twenty fresh cadaveric femurs underwent standard preparation followed by cerclage wiring on the left femur. Biomechanical evaluations were conducted under axial loading on the femoral stem until catastrophic failure. Shapiro-Wilk test and independent t-tests were utilized for energy absorption, ultimate load, seeding load, and subsidence analyses.





Results
The wiring group exhibited higher absorption force before femoral stem failure (41.9±18.1 Nm) compared to the non-wiring group (41.0±19.1 Nm) (p=0.918). However, ultimate load and seeding load were lower in the wiring group (7.7±2.1 kN and 3.1±0.7 kN, respectively) than the non-wiring group (7.7±2.0, p=0.901), (3.4±1.4, p=0.589). Both groups demonstrated comparable subsidence distances: wiring group (7.7±2.6 mm) and non-wiring group (7.7±3.8 mm) (p=0.978).

Conclusion

The wiring group exhibited higher energy absorption before fracture occurrence, but no significant difference in ultimate load to fracture was observed. Additionally, comparable subsidence distances suggest no substantial advantage of wiring for prophylaxis. It's noted that wiring may deform proximal morphology, potentially altering stem load distribution to the proximal femur.

P1254

INFLUENCE OF VERTEBRAL EXCLUSION ON PRECISION ERROR AND LSC IN DXA STUDIES

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Introduction: Osteoporosis is a common bone disease marked by decreased bone mineral density (BMD) and quality, leading to a heightened risk of fragility fractures. Dual-energy X-ray absorptiometry (DXA) is considered the "gold standard" for diagnosing osteoporosis and is essential for monitoring treatment efficacy. The World Health Organization (WHO) established diagnostic criteria for osteoporosis using T-score thresholds in 1994, where the T-score reflects the patient's BMD in comparison to a young adult reference population. According to the International Society for Clinical Densitometry (ISCD), osteoporosis is diagnosed when the T-score is less than or equal to -2.5 in any evaluable region. In lumbar spine assessments, the ISCD recommends excluding vertebrae that are non-evaluable or differ significantly from adjacent vertebrae, requiring at least two vertebrae for an accurate diagnosis.

Given that DXA measures bone mass in g/cm² and is not entirely reproducible, it is crucial to calculate precision error and the Least Significant Change (LSC) for reliable assessments. The LSC must be determined for each region reported and for all possible combinations of vertebrae if exclusions are necessary. The objective of the study is to analyze the variations in precision error and LSC obtained through DXA across different vertebral combinations, thereby enhancing the understanding of how these factors impact osteoporosis diagnosis and management.

Materials and Methods: A prospective study was conducted at a reference center in Buenos Aires in April 2024 to evaluate precision and LSC. Following ISCD guidelines, the performance of technicians, DXA equipment, and biological variability were assessed. Two technicians evaluated 30 representative female participants, each scanned twice, resulting in 120 studies for analysis. The study adhered to the Helsinki Declaration principles, received local committee approval, and informed consent was obtained.

In the short-term precision study, bone mineral density (BMD) of the lumbar spine anteroposterior (LSAP) was measured using a GE Lunar Prodigy device. A total of 30 individuals were assessed by two technicians, ensuring a 95% confidence interval (CI), with all evaluations conducted on the same day and involving repositioning of patients. For each technician, 30 standard deviations (SD) and coefficients of variation (CV) were calculated, which were then squared and averaged. The square roots of the SD (RMS-SD) and CV (RMS-CV) multiplied by 100 were computed to express the precision error in both grams and percentage. Additionally, LSC was calculated in grams and percentage, also with a 95% CI, to evaluate the reliability of the measurements.

Results: The mean age of participants was 61.99 ± 13.37 years, with a weight of 66.88 ± 13.53 kg and height of 157.66 ± 6.25 cm. The study found that precision error increases with vertebral exclusions, leading to substantial variations in minimal significant change (Table 1). The L1-L4 region exhibited a lower minimal significant change, indicating it should not be used when reporting on two or three vertebrae, as misreporting could result in inappropriate therapeutic decisions .

	1 vertebra	2 vertebrae	3 vertebrae	4 vertebrae
BMD gr/cm²	1.036	1.055	1.056	1.050
RMS-SD g/cm²	0.019	0.012	0.009	0.007
RMS-CV %	1.71	1.09	0.80	0.62
LSC gr/cm²	0.053	0.034	0.025	0.018
LSC (%)	**4.7**	3.0	2.2	1.7

Conclusion: Measuring BMD from L1-L4 presents challenges; thus, the ISCD recommends excluding this region when necessary. Reports often exclude vertebrae without calculating the corresponding LSC for all combinations. This study emphasizes the necessity of determining precision error and LSC for all vertebral combinations, highlighting clinical differences and increased variability when fewer regions are analyzed. To our knowledge, no local data exist demonstrating these variations post-exclusion of regions of interest. This research aims to enhance the quality of densitometry studies and reports, ensuring their reliability.

P1255

THE STATUS AND TRENDS OF OSTEOPOROSIS RESEARCH IN THE WORLD: WITH EMPHASIZES ON THE HIGHLY-CITED PAPERS

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Objectives: Many studies have been done on osteoporosis. So, this study provides an overview of researchers' efforts and knowledge gaps by analyzing the publications related to osteoporosis and shows much information such as the active organizations and authors, highly-cited papers, and topic trends of these studies.
Material and Methods: The search in the Web of Science (WOS) database was conducted until August 14, 2024, and all articles containing "osteoporosis" or "osteoporoses" in their keywords or titles were extracted and analyzed. Also, the Highly-Cited Papers (HCP) of the last ten years were extracted and visualized using WOS software and bibliometrix R-package 4.1.1.
Results: In total, 57,579 documents were retrieved. The most documents were articles (n=40,842), followed by meeting abstracts and reviews. The USA (n=11795) followed by China, England, Japan and Italy were the most productive countries. “University of California System” (n=1350) and then “Harvard University” (n=1065) had the most publications. “Cyrus Cooper” (n=469) from “University of Southampton” (UK) has been the most prolific author in this field, and “Osteoporosis International” (n=5627), “Journal of Bone and Mineral Research” (n=1991) and “Bone” (1543) published the most articles in this field. The results of the analysis of 187 HCP in osteoporosis also showed that “Cyrus Cooper” (n=15) had the most HCP. “University of Sheffield” (n=25) and “University of Southampton” (n=17) were the most productive organizations. “Osteoporosis International” (n=15) and “Journal of Bone and Mineral Research” (n=8) also published the most HCP. “Postmenopausal women” was the most frequented keyword and “oxidative stress” was the topic trend of the last ten years and in 2024. Two articles were also Hot-Papers, one was a guideline and one was a review of the global prevalence of osteoporosis.
Conclusion: Osteoporosis is a skeletal disorder that gradually reduces bone strength and exposes a person to the risk of sudden and unexpected fractures. Analysis of studies that have been conducted in this field showed that most authors and institutions with HCP were from the UK and “Osteoporosis International” has published the most articles in the field of osteoporosis in the world and also the most HCP.

P1256

KNOWLEDGE MAPPING OF GLOBAL PUBLICATIONS ON PITUITARY DWARFISM

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Background and purpose: Pituitary dwarfism is a form of dwarfism caused by complete or partial growth hormone deficiency. This research is purposed to analyze and map the scientific characteristics of studies conducted in this field from the beginning to the present and to identify the most active countries, organizations, and individuals, as well as the trend topics carried out in recent years.
Methods: All articles indexed in PubMed/Medline that had the MESH’s subject heading of "Pituitary dwarfism" and were published up to 2024 were extracted and analyzed. In total, 2616 documents were retrieved from 1946 to 2024, which were analyzed and visualized using the VOSviewer software and bibliometrix package on R software.
Results: The highest number of documents were produced in the year 2022 (n=84), then in 1972 (n=83) and 1970 (n=74). "The Journal of Clinical Endocrinology and Metabolism" published by far the most papers in this field (n=138). Then "Growth Hormone & IGF Research" (n=78) and "Journal of Pediatric Endocrinology & Metabolism" (n=60) published the most papers in this field, respectively. "K Shizume " with 46 documents from Japan and "R Salvatori" (n=43) from the USA were the most active authors. Also, the “Federal University of Sergipe” (n=238), “Peking Union Medical College Hospital “ (n=42) and the “University Of Palermo” (n=35) were the most active organizations. Among the countries, the USA (n=628), Italy (n=618), China (n=530), Brazil (n=354), and Japan (n=262) published the most documents. The topics "Histidine", "mannitol", and "human growth hormone/adverse effects" have been the most trending in the last two years.
Conclusion: The surge in scientific output in 2022 highlights enhanced improvements in diagnostic methods and treatment protocols for pituitary dwarfism. Also, understanding of the genetic and hormonal mechanisms underlying the condition, alongside advancements in imaging technologies like MRI, have improved the diagnosis and assessment of growth hormone deficiencies. Furthermore, the progress made during the past decades reflects the evolution of treatment approaches, particularly the development of more effective hormone replacement therapies. Together, these advancements have likely contributed to a decline in severe cases of pituitary dwarfism and associated complications.
Keywords: Pituitary Dwarfism, Knowledge Mapping, Scientometric Analysis

P1257

ANALYSIS AND VISUALIZATION OF SYSTEMATIC REVIEWS ON METABOLIC BONE DISEASES

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Objectives: Metabolic bone diseases such as mucolipidoses, osteoporosis and rickets are diseases that affect the metabolic processes of bone tissue. In this research, we aimed to analysis of systematic reviews conducted in this field and visualize their characters to obtain an overview and find the gaps in this type of studies conducted in this field.

Material and Methods: We selected the "Metabolic Bone Diseases" in Medical Subject Headings (MESH) then searched PubMed to retrieve all published documents on this subject up to August 2024 and limited that to systematic review document type. The results were saved and then analyzed and visualized using the bibliometrix R-package 4.1.1.

Results: 1124 systematic reviews were retrieved, and published between 1997 and 2024. The largest number of articles was published in 2023 (n=127) and 2022 (n=105). The journals "Osteoporosis International" (n=168) and "The Cochrane Database of Systematic Reviews" (n=67) published the most articles and " Ann Cranney " (n=3) and " Peter Tugwell " (n=20) both from Canada were the most prolific authors in this field. The countries China (n=1797), USA (n=441), Canada (n=392), and Italy (n=376) had published the most documents respectively. Also, the "University of Toronto" (n= 67), "Sichuan University" (n= 50), "Kaohsiung Medical University" (n= 46), and "Tehran University of Medical Sciences" (n= 45) were the most prolific organizations. Among the topics, "bone diseases, metabolic", "network meta-analysis", and "diphosphonates/adverse effects" were the trend of the year 2023 and "bone density", "aged", "randomized controlled trials", "middle-aged", "risk factors", and "bone density/drug effects" were the most frequently used keywords.

Conclusion: "Metabolic Bone Diseases" was a trending topic last year in systematic reviews in this field. The most active countries and organizations in this field were from the Asian continent, mostly from China. And the most prolific authors were from Canada.

Keywords: Metabolic Bone Diseases, Visualization, Scientometric Analysis, Bibliometric Analysis, Systematic Reviews

P1258

RANDOMIZED CLINICAL TRIALS ON THE TREATMENT OF BONE CANCERS: ANALYSIS & VISUALIZATION

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Objectives: Bone neoplasms are tumors or cancers located in bone tissue or specific bones. In this research, we purposed to review and analyze Randomized Controlled Trials (RCT) studies conducted in the field of treatment of this disease to identify the most relevant topics and the most active individuals and organizations in this field, and to present knowledge gaps to provide a roadmap for researchers in this field.

Material and Methods: The subject headings of "bone neoplasms" and "therapy" were extracted from the Mesh database and searched in PubMed. Then they were limited to the type of evidence that was RCT. 744 studies from 1972 to 2024 were retrieved and subjected to scientometric analysis using the R program.

Results: Analysis of these RCTs showed that most of these RCTs were produced in 2016 (n=34), 2015 (n=32), and 2014 (n=31) respectively. 4916 authors contributed to the production of these documents, of which only 20 were single-authored articles, and the rest were written in groups. The average number of authors in these articles was 9.55, and their international collaboration was 10.35. "Yvette M van der Linden" with 20 articles from the Netherlands has been the most prolific author in this field. Also, the "Journal of Clinical Oncology"(n=71), "Cancer"(n=41) and "European Journal of Cancer"(n=34) published the most RCT articles. Among the countries, The USA (n=92), Germany (n=49), and China (n=42) had the most RCT articles. The most important trending topics over the years have been "middle-aged", "aged", "adult ", "treatment outcome", "prospective studies", "adolescent", "survival rate", "double-blind method", and "combined modality therapy".

Conclusion: Since 2016, the number of RCT studies in this field has been declining, and given the importance of treating bone cancers, more studies are needed in this field. Analyzing these studies, from time to time, and finding characters of them can help to better conduct future studies and fill knowledge gaps.

Keywords: Randomized Controlled Trials, RCT, Bone Cancer, Therapy

P1259

ANALYSIS OF THE TOP 100 MOST-CITED PAPERS ON FRACTURE & CANCERS

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Background and purpose: Fracture and cancer are associated with each other, and studies have shown that the risk of fracture is two times higher in cancer survivors compared with individuals with no history of cancer, and injury may lead to finding cancer in the injured area. Therefore, this study aims to analysis the most cited articles published in this field to provide an overview of the most influential articles on this topic.

Methods: All articles that contained words related to the concepts of fracture and cancer in their titles or keywords were searched and retrieved through a search strategy designed in the Web of Science database in August 2024 (4405 articles). They were then sorted by number of citations to identify the top 100 most cited articles. Data were analyzed using the bibliometrix R-package to analyze and map the networks, topics and characteristics of these articles.

Results: Analysis of the top 100 most cited articles showed that these articles were published from 1991 to 2019, with the highest number of articles(n=9) published equally in 2002 and 2005. The most cited article was entitled “Risks and Benefits of Estrogen Plus Progestin in Healthy Postmenopausal Women: Principal …” by “Jacques E Rossouw” and his colleagues from the USA published in 2002 and in JAMA (n=11,897), followed by a paper by “Cosman F” in 2014 published in “Osteoporosis International” (n=2,091). “Cauley JA” published the most articles of these top 100 articles (n=6), and “University of California, San Francisco” (n=18) and "University of Toronto” (n=14) being the most prolific institutions. Also, the most active countries were the USA (n=320), UK (n=45), Canada (n=43), Germany(n=16), and Japan (n=15). The most frequently used keywords in these articles were “Breast Cancer”, “Hip Fracture”, “Bone Mineral Density”, “Postmenopausal Women”, and Risk, respectively.

Conclusion: Of the countries, the USA had the most cited articles in the world and the most cited articles. The topic of fractures was more frequently discussed in these articles related to women's cancers, including breast cancer. This could be due to the importance of hormonal issues in women's cancers and their impact on bone fractures.

Keywords: Fracture, Cancers, Scientometric Analysis, Most-Cited Papers

P1260

SCIENTIFIC OUTPUTS ON OSTEOARTHRITIS IN THE MIDDLE EASTERN COUNTRIES: A SCIENTOMETRIC ANALYSIS OF THE LAST TEN YEARS' ACTIVITIES

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Background and purpose: Osteoarthritis is a progressive, degenerative joint disease in the elderly but from biochemical changes and biomechanical stresses affecting articular cartilage. This study aims to scientometric analysis of the research conducted in Middle Eastern countries in this field and to determine the status of research in these countries.

Methods: All terms related to the concept of Osteoarthritis were extracted from the MESH database and the search strategy was conducted in the titles and keywords of articles indexed in the Scopus database from 2015 to 2025. The results were limited to Middle Eastern countries and the documents were analyzed using VOSviewer and CiteSpace software.

Results: In total, 4415 documents were extracted between 2015 and 2025, most of which were published in 2024 and were mostly, Article, Review, Letter, Book chapter, and Conference paper type. “International Orthopaedics” (n=60), “Archives of Bone and Joint Surgery” (n=55), and “BMC Musculoskeletal Disorders” (n=53) published the most articles in this field. Among the countries, Turkey (n=1517), Iran (n=1166), Saudi Arabia (n=646), and Egypt (n=633), had the most publications. Also, “Tehran University of Medical Sciences” (n=209), “Shahid Beheshti University of Medical Sciences” (n=204), “King Saud University” (n=189), “Cairo University” (n=181), and “Iran University of Medical Sciences” (n=177) were the most active organizations, respectively. “Jean-Yves Reginster” (n=63), “Cyrus Cooper” (n=51), and “Olivier Bruyère” (n=50), from Belgium and the UK, were the most prolific authors, collaborating with Saudi Arabia. The article, "Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases…", was the most cited article (n=5870). Among the topics and keywords, "Knee Osteoarthritis", "Controlled Study", "Major Clinical Study", "Follow Up", "Procedures", "Visual Analog Scale", and "Treatment Outcome" were the most used and noted.

Conclusion: Since 2018, the trend of scientific production in the Middle East in Osteoarthritis has been on an upward trend and has reached its peak in the last year. All Middle East countries were active in this field, but Turkey had the most publications. Most of the knowledge-producing organizations were related to Iran. The most prolific authors were from outside the Middle East, which collaborated with Saudi Arabia.

Keywords: Osteoarthritis, Middle East, Scientometric Analysis

P1261

ANALYSIS OF HIGHLY-CITED PAPERS & HOT PAPERS ON ARTHRITIS RHEUMATOID

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Background and purpose: Arthritis Rheumatoid is a chronic inflammatory and autoimmune disease that causes pain in the joints. This study aims to achieve up-to-date and effective knowledge by analyzing Highly-Cited Papers (HCP: Papers that have received more citations than their peers in the last ten years) and Hot Papers (HP: Papers that have been published in the last two years and have received a lot of citations in recent 2 months) in this field.

Methods: A search was conducted on the keywords of indexed documents in the Web of Science database up to 2025. Then, it was limited to HCP and HP. The papers were analyzed using scientometric software from various perspectives, and the active authors, organizations, and main and hot topics of recent years in this field were identified.

Results: In total, 561 HCP and 11 HP were retrieved between 2014-2024 and most of them were published in 2023, followed by 2021 and 2022. In HCP, each article had an average of 283.2 citations. Co-authors per document were 8.54 and international co-authorships were % 47.42. "Désirée van der Heijde" (n=15) from Netherlands and "Josef S Smolen" (n=14) from Austria were the most active authors. USA (n=851), UK (n=364), China (n=297) and Germany (n=192) had the most documents and among organizations, "Medical University of Vienna " (n=37) and "Harvard Medical School" (n=33) had the most HCP productions, respectively. The article "NF-κB signaling in inflammation." by Liu, T., et al had the highest number of citations (n=5663). The most frequented keywords were, "double-blind", "nf-kappa-b", "systemic-lupus-erythematosus", "efficacy", "collagen-induced arthritis", "dendritic cells", "in-vitro", "risk", "disease-activity", "expression", and "tumor-necrosis-factor". Analysis of 11 HP also showed that "Annals of The Rheumatic Diseases" (n=57) had published the most articles and the most active organization was, "Sichuan University (n= 4). Also, the HP topics are, "monoclonal-antibody", "systemic-lupus-erythematosus", "molecular-cloning ", "plasmacytoid dendritic cells", "risk", and "Alzheimer-disease.

Conclusion: The USA has published the most HCP and HP and most of these articles have been published in the last year. These are influential articles and reviewing them from time to time can provide up-to-date and useful information for awareness of effective research and for conducting future studies.

Keywords: Arthritis Rheumatoid, Highly -Cited Papers, Hot-Papers

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SCIENTOMETRIC ANALYSIS AND MAPPING OF THE CASE REPORTS CONDUCTED ON THE OSTEITIS DEFORMANS

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Background and purpose: Osteitis Deformans or Paget's disease of bone, is a very common chronic bone disorder characterized by excessive breakdown and regrowth in the affected bone. This study aims to analyze and visualize the characteristics of the case reports produced so far in this field and identify the topics of these documents.

Methods: All case reports in the field of Osteitis Deformans from the beginning to the end of 2024 were extracted by searching for this concept in the MESH database and limiting it to the case reports filter. The results were saved and analyzed using scientometric software such as R bibliometrix and CiteSpace, and knowledge visualization was performed.

Results: 1326 case reports were retrieved from 1955 to 2024, with 4287 authors contributing. Annual growth rate was % 2.86 and 167 authors were of single-authored documents. Co-Authors per Documents was 3.54 and the international co-authorships was % 0.7541. Most of these case reports were published in 1979 and in the last 5 years, most were published in 2022 with 10 articles. The journals "Clinical Nuclear Medicine" (n=66), "Skeletal Radiology" (n=40), And "Clinical Orthopaedics and Related Research" (n=30) published the most case reports in this field. USA, China, India, Italy, Spain, Germany, and Turkey had the most scientific production in this field, respectively. Also, "Peking Union Medical College Hospital" (n=20), "University of Auckland" (n=15), and "Mayo Clinic" (n=14) were the most active organizations. In addition, "Michael P Whyte" from the USA was the most prolific author of this type of document(n=14). Radiography, diagnosis differential, osteitis deformans/complications, radionuclide imaging, and tomography x-ray computed, were the most frequently used keywords.

Conclusion: The number of case reports in the field of Osteitis Deformans has decreased in recent decades compared to the 1970s. The USA and China have been the leaders in producing these documents, and topics related to diagnosis and medical imaging have been the most discussed topics in this type of study.

Keywords: Case Reports, Osteitis Deformans, Scientometric Analysis

P1263

THE TOP 100 ARTICLES IN THE FIELD OF OSTEOPOROSIS AND TREATMENT: SCIENTOMETRIC AND CONTENT ANALYSIS

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Background and purpose: Osteoporosis is a common disease and numerous studies have been conducted in the field of its treatment. This study aims to analyze the top 100 most-cited articles among all the documents published in this field and to identify their characteristics, topics, document type, journals, authors and organizations active in publishing these articles.
Methods: First, all articles in the field of treatment and osteoporosis that were indexed in the Web of Science database until August 2024 were extracted, and then the top one hundred articles in terms of the number of citations were identified and saved in the required formats for scientometric and content analysis.
Results: The results showed that these articles were published between 1993 and 2022, and most of them were published in 2016 (n=14) and then in 2020 (n=10). Most of these articles were published in the "Osteoporosis International" (n=11) then in "Archives of Osteoporosis" and "New England Journal of Medicine" both with 6 articles. "Cyrus Cooper" (n=13) and "John A. Kanis" (n=12) from the UK had the most articles on this topic. The USA and UK countries and organizations such as "The University of Sheffield" (n= 28), "University of California, San Francisco" (n=19) and "The University of Southampton" (n= 15) were also the most active and had the most cited articles, respectively. The article entitled "Osteoporosis Prevention, Diagnosis, and Therapy" published by "Anne Libanski" and et. al. in "JAMA-Journal of The American Medical Association" in 2001 (IF=63.5, Q1) had the most citations (n=3766) and with 150.64 citations per year. "bone-mineral density", "postmenopausal women", "hip fracture", "vertebral fractures", "zoledronic acid" were the most relevant keywords, respectively. Also, content analysis of these articles showed that most of these studies were review and systematic review types, followed by clinical trials and guidelines.
Conclusion: In producing the top 100 most cited and influential articles in the field of osteoporosis treatment, it is observed that authors and organizations from the UK have shown more activity over the years. Also, review studies in this area are important and have received more citations.

Keywords: Osteoporosis, Treatment, Scientometric, Most-Cited Articles

P1265

EB613 TABLET TREATMENT [ORAL PTH(1-34)] – DOES PK DRIVE BONE MODELING VERSUS BONE REMODELING?

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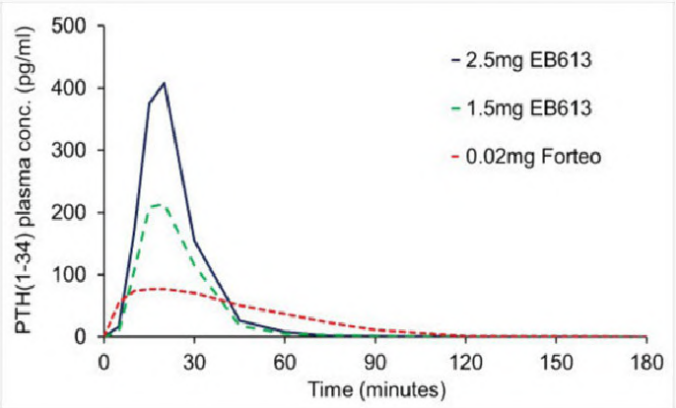
Objectives: EB613 is being developed as a first-in-class oral daily tablet treatment of PTH(1-34) for postmenopausal women with osteoporosis at increased risk for fracture. In a 6-month Phase 2 study (NCT04003467) in 161 postmenopausal women with low BMD or osteoporosis, EB613 showed dose-dependent increases in BMD at the lumbar spine, total hip, and femoral neck and a dual mechanism of increases in bone formation (PINP) and decreases in bone resorption (CTx). Here, we report Phase 1 data that assessed PK of the two EB613 doses, which will be advanced to Phase 3.
Materials and Methods: In a cross-over Phase 1 study (NCT05965167) in 15 healthy young male volunteers, EB613 (1.5 and 2.5 mg) and injectable PTH(1-34) (0.02 mg) were administered in a random sequence following an overnight fast. The PK profile of PTH(1-34) was assessed following the three treatments.
Results: EB613 1.5 and 2.5 mg dose levels were characterized, respectively, by a rapid increase in plasma PTH(1-34) (Tmax within 20 min), rapid elimination (T1/2 of 11.1 and 8.8 min) and generally dose-proportional increases of mean Cmax (270 vs 488 pg/ml) and mean AUClast (4,590 vs 7,590 pg/ml*min). The overall duration of exposure was substantially shorter than the PTH(1-34) injection (median Tlast 20, 30, and 75 min for EB613 1.5 mg, 2.5 mg, and injection, respectively) (Figure). EB613 was well tolerated: all AEs were mild or moderate, and there were no SAEs.
Conclusion: The PK profile of EB613 is characterized by a shorter systemic exposure vs the SC injections of PTH(1–34). While the AUC of maximal clinical EB613 dose (2.5 mg) is similar to that of the daily injection, Cmax is much closer to that of the reported once-weekly injection (0.056 mg). In contrast to the daily injection, EB613 and the reported weekly injection appear to have a dual anabolic and antiresorptive effect, maintaining bone formation while reducing bone resorption, a potentially ideal osteoanabolic treatment. Safety and efficacy of EB613 will be evaluated in the planned Phase 3 trial.
Disclosures: GB, CI, HG, AH, AR, and **MT** are employees of and may own stock/options in Entera Bio Ltd. **RBW** is an advisor to Entera with financial and stock options. **CS** and **YC** nothing to disclose.



P1266

WHAT PATIENTS THINK ABOUT THE IMPACT OF DIET ON SPONDYLOARTHRITIS

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Background:
Rheumatic patients often seek dietary solutions to alleviate their symptoms.
Objectives:
Our aim is to understand the ppatients eating habits and the beliefs underlying these practices.
Methods:
A cross-sectional descriptive study conducted in our rheumatology department recruited patients with axial spondyloarthritis (AS). The patients completed a questionnaire exploring their eating habits, diets followed (sugar-free, cow's milk-free, gluten-free, olive oil consumption, turmeric, fruits, green vegetables, red meat, fatty fish, nuts), and the perceived effects of diet on rheumatic symptoms (pain, fatigue). Analytical analyses assessed the association between eating habits or the impact of food on disease activity.
Results:
A total of 39 patients were included and analyzed, with an average age of 45 ± 10.4 years; 88.5% of patients with AS were receiving biologic therapy. The mean disease activity scores (BASDAI, BASFI, ASDAS (vs), and ASDAS (CRP)) were 3.5 ± 1.2, 3.9 ± 1.3, 2.7 ± 0.8, and 3 ± 0.7, respectively. Twenty-five percent of patients had followed or were following at least one specific diet. The most commonly followed diet was sugar-free (by 8 patients). Two patients were following a gluten-free diet. In our study, we did not find any patients following a cow's milk-free diet. Of all the diets followed, 50% were associated with a reduction in pain and 80% with an improvement in general condition. Only 22% of patients had adopted the diet based on a doctor's advice. Dairy products, red meat, and sugary foods were more often reported to increase pain, while green vegetables, fruits, fatty fish, and turmeric were more frequently reported to reduce pain. We compared the disease activity of patients following a diet with those not following a diet: BASDAI 2.5 ± 0.8 vs 4.2 ± 1.02 ($p < 0.001$); BASFI 3.2 ± 0.8 vs 4.4 ± 1.2 ($p = 0.01$); ASDAS (CRP) 2.2 ± 0.8 vs 3.01 ± 0.9 ($p = 0.02$). Health beliefs and lack of information were important determinants in adopting a diet or perceiving an effect on pain.
Conclusion:
Our study shows that following a sugar-free or gluten-free diet may have a beneficial effect on the activity of rheumatic diseases. This study provides insight into the determinants of eating practices and beliefs in the Tunisian population. It encourages the inclusion of diet in the management of rheumatic diseases and emphasizes the need to better educate our patients about the effects of diet.

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JUVENILE IDEOPATHIC ARTHRITIS AS SEEN BY YOUNG PEDIATRICIANS: WHAT BELIEFS AND WHAT ISSUES?

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Background:
Although juvenile idiopathic arthritis (JIA) is common in children, it remains poorly understood by many pediatricians. Objectives: This study aimed to assess their knowledge of the epidemiology, clinical features, and treatment of this disease.
Methods:
An online survey was created using Google Forms and sent via social media to pediatric residents. Thirteen questions were designed to assess beliefs and misconceptions about JIA. These were organized into three blocks of multiple-choice questions: "epidemiology" (4 questions), "clinical and laboratory manifestations" (6 questions), and "therapy" (3 questions).
Results:
A total of 43 pediatric residents responded to the survey, of whom 69.7% were women. Regarding age, 23.2% of respondents knew that oligoarticular JIA more commonly affects girls aged 2 to 4 years. Most of them thought that oligoarticular JIA was more frequent in adolescents (44.1%), and 32.5% considered that the disease was more common in boys, regardless of age. On the other hand, most participants knew that oligoarticular JIA was the most common form of JIA (76.7%) and that uveitis was more frequent in patients with positive ANA. The majority of the residents surveyed (65.1%) selected arthralgia as the most frequent symptom of oligoarticular JIA. Most respondents were aware of the recommendation for regular uveitis screening (81.3%) and the clinical features of inflammatory back pain (93%). More than half of the survey participants (60.4%) correctly indicated that inflammation markers could be either normal or elevated, while others thought they were generally elevated (20.9%) or that inflammation markers were elevated in polyarticular forms but not in oligoarthritis (18.6%). Sixty-nine percent of the doctors knew that NSAIDs do not alter the course of arthritis. Regarding biolog-

ic therapy, most respondents (71%) knew that these medications are used in patients whose disease is refractory to disease-modifying antirheumatic drugs such as methotrexate.
Conclusion:
This study highlighted significant gaps in the knowledge of young pediatricians regarding JIA, which could delay patient referral. In particular, one-third of respondents had misconceptions about biologic therapies.

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WHAT IS THE IMPACT OF INTERMITTENT FASTING ON THE EVOLUTION OF RHEUMATOID ARTHRITIS UNDER BIOLOGICAL TREATMENT?

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Background:
Several experimental studies have highlighted the role of intermittent fasting in immune responses that reduce inflammation. Various fasting protocols, supported by experimental studies, have recently gained popularity among the general public. Fasting leads to a reduction in oxidative stress and inflammation, enhances cellular protection, and increases resistance to harmful insults.
Objectives:
Our aim is to describe the rheumatoid arthritis activity during the fasting period (Ramadan).
Methods:
We conducted a cross-sectional study on patients with rheumatoid arthritis (RA) according to the 2010 ACR/EULAR criteria, treated with biologic therapy. RA activity was assessed two months before Ramadan (February 2024) and during the Ramadan fasting period in Tunisia (intermittent fasting) using clinical parameters, the Visual Analog Scale (VAS) of pain (10 cm), morning stiffness, nocturnal awakenings, number of painful joints (NPJ), and number of swollen joints (NSJ); biological parameters, including C-reactive protein (CRP); and disease activity scores, DAS28 (CRP) and DAS28 (ESR) for RA. Data analysis was performed using SPSS software.
Results:
We included 40 patients, with a mean age of 52 ± 7 years, and 92% were women. The average disease duration was 11.68 ± 8.81 years. RA was seropositive (RF and/or anti-CCP) in 77% of cases, erosive in 70%, and deforming in 45%. Coxitis was present in 25% of patients, including two with bilateral coxitis. Forty-five percent of patients had osteoporosis and were on treatment, and 22.5% had diffuse interstitial pneumonia. Thirty-five patients were on conventional disease-modifying antirheumatic drugs (DMARDs), with 80% on Methotrexate, 14% on Leflunomide, and 5% on Sulfasalazine. All patients were on biologic therapy, with 50% on Infliximab, 35% on Certolizumab, 5% on Adalimumab, 7.5% on Tocilizumab, and 2.5% on Rituximab. Eighty-five percent were on corticosteroids, and 13% were on non-steroidal anti-inflammatory drugs (NSAIDs). The following parameters were lower during the Ramadan month compared to the pre-Ramadan period: NPJ 3.8 vs 8.6 (p = 0.02); NSJ 2.1 vs 4.8 (p = 0.01); mean CRP 8.1 vs 24.6 (p = 0.001); mean DAS28 CRP 3.2 vs 4.25 (p = 0.01); mean DAS28 (ESR) 3.1 vs 3.9 (p = 0.05); pain VAS 5.2 vs 3.4 (p = 0.01). However, we found no statistically significant association between intermittent fasting and nocturnal awakenings or morning stiffness.
Conclusion:
Our study concluded that intermittent fasting was associated with reduced RA activity. Integrating intermittent fasting could promote optimal health and reduce the activity of certain chronic inflammatory diseases.

P1269

SHARED DECISION-MAKING IN IDEOPATHIC JUVENILE ARTHRITIS: THE PHYSICIAN'S PERSPECTIVE

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Background:
Shared decision-making (SDM) has proven to be useful in managing chronic diseases. This study aims to evaluate the practice of SDM by physicians treating patients with juvenile idiopathic arthritis (JIA), as well as the obstacles they face, particularly when initiating biologic treatments.
Objectives:
The aim of this study was to evaluate the practice of SDM among physicians treating patients with JIA, and to identify the obstacles they encounter, particularly in the initiation of biologic treatments.
Methods:
A national online survey was conducted. The questions were designed by the authors to assess SDM and its associated obstacles, targeting pediatric and rheumatology residents. The survey was created using Google Forms and sent via social media platforms (Messenger, WhatsApp) to residents.
Results:
A total of 60 pediatric and rheumatology residents responded to the survey. Most of the respondents (70%) were women. Seventy-five percent of respondents indicated that SDM was their usual approach for decisions regarding biologic treatments. When asked about the importance of specific aspects of the SDM process, most physicians reported that discussing the advantages and disadvantages, as well as treatment options between the parents and the doctor, were very or extremely important factors. Additionally, 55% of physicians considered it extremely important for parents to provide information to the doctor, and 79% of physicians believed that the information provided by the doctor to the parents was extremely important. Most respondents felt that parental trust (87%) and emotional openness (70%) greatly facilitated SDM. When making decisions with adolescents, most respondents stated that the patient's trust (80%), emotional preparedness (60%), and willingness to engage in the discussion

(60%) could significantly help facilitate SDM. The obstacle most perceived as interfering with the SDM process was limitations related to social insurance (30%). Regarding obstacles to SDM with adolescents, 21% of respondents thought that the difficulty in accepting their own diagnosis interfered with SDM.
Conclusion:
Our results highlight the interest of physicians in a collaborative approach with families. While some obstacles, such as those related to health insurance constraints, are more difficult to overcome, others, such as those related to skills and tools, can be addressed to promote shared decision-making, particularly regarding biologic treatments.

P1270

SELF-ESTEEM: A MAJOR ISSUE IN RHEUMATOID ARTHRITIS

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Background:
The self-esteem of patients with chronic diseases is closely related to their health status and their perception of the disease. This study aims to explore how psychological well-being and social support influence self-esteem in individuals suffering from chronic inflammatory rheumatic diseases. Objectives:
The aim of this study was to explore how psychological well-being and social support influence self-esteem in individuals suffering from chronic inflammatory rheumatic diseases.
Methods:
This is an analytical cross-sectional study involving patients with chronic inflammatory rheumatic diseases (CIRDs) followed in a rheumatology department. Sociodemographic, clinical, paraclinical, and therapeutic data were collected. Each patient completed validated questionnaires: the MSPSS score assessing perceived social support (The Multidimensional Scale of Perceived Social Support), the Rosenberg Self-Esteem (RSE) score, and the HAD score evaluating anxiety and depression (Hospital Anxiety and Depression Scale). We used validated Arabic versions of these questionnaires.
Results:
A total of 82 patients participated: 58 women and 24 men, with an average age of 51.4 years [18-72 years]. Rheumatoid arthritis was seropositive in 71.9% of cases. The mean disease duration was 11.2 years [1-35 years], and disease activity was moderate to high in 60.9% of cases. The mean MSPSS score was 57.9 [14-82]. Social support levels were considered "low" in 9 patients (10.9%), "moderate" in 45 patients (54.8%), and "high" in 28 patients (34.1%). The mean RSE score was 25.6 [14-38]. Self-esteem levels ranged from "low" to "very low" in 34 patients (41.4%). Fourteen patients (17.1%) had suspected anxiety, and 28 patients (34.1%) had definite anxiety. Eight patients (9.7%) had suspected depression, and 39 patients (47.5%) had definite depression. A significant correlation was found between MSPSS and RSE scores ($r = 0.4$; $p < 0.001$). The RSE score was inversely correlated with the HAD-anxiety score ($r = -0.8$; $p < 0.001$) and the HAD-depression score ($r = -0.8$; $p < 0.05$).
Conclusion:
Our results show that strong social support is associated with better self-esteem and a reduction in anxiety and depression.

P1271

FACIAL SKIN LESIONS: A PSYCHOLOGICAL BURDEN FOR LUPUS PATIENTS

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Background:
Self-esteem and body image are key components of quality of life. Facial lesions associated with lupus can affect these dimensions.
Objectives:
Our study aims to assess the impact of these lesions on the self-esteem of patients with lupus.
Methods:
This is a descriptive cross-sectional study involving patients with systemic lupus erythematosus (SLE) followed in a rheumatology department. The included patients completed the Rosenberg Self-Esteem Scale (RSE) questionnaire. All data were collected with patient consent and analyzed using SPSS statistical software.
Results:
Forty-five patients meeting the 2019 ACR/EULAR classification criteria for systemic lupus erythematosus were included. There were 7 men and 38 women, with a female-to-male ratio of 5.4. The median age was 46 ± 4.2 years [19-66 years], and the average disease duration was 8.6 ± 7.2 years. Thirty-two (71.1%) patients had cutaneous manifestations. Twenty-one patients (46.67%) had a butterfly-shaped facial erythema, 7 patients (15.56%) had erythematous lesions on the forearms, and 2 women had mouth ulcers. Raynaud's phenomenon was observed in 3 patients (6.67%). Renal involvement was seen in 2 patients (4.4%). The mean Rosenberg Self-Esteem Scale score was 25.1 ± 2.1, reflecting low self-esteem. The Rosenberg Self-Esteem score was negatively correlated with cutaneous involvement ($r = -0.27$; $p = 0.04$). Low self-esteem levels were more strongly associated with facial symptoms, and there was no correlation between the RSE and gender, age, or renal manifestations.
Conclusion:
Patients' perception of their facial involvement in systemic lupus erythematosus is poor and can be considered an important component of their self-esteem. Effective interventions should be implemented during follow-up to improve body image function and satisfaction.

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SPONDYLOARTHRITIS: A BARRIER TO WORK?

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Background:
Spondyloarthritis (SPA) significantly affects the quality of life and work productivity of patients.
Objectives:
This study aims to quantify this loss of productivity.
Methods:
Patients in this cross-sectional study were recruited from a rheumatology department. Sociodemographic, clinical, paraclinical, and therapeutic data were collected. Each patient completed validated questionnaires: the Rosenberg Self-Esteem Scale (RSE), the Work Productivity and Activity Impairment (WPAI) questionnaire, the Workplace Activity Limitations Scale (WALS), consisting of 12 items (total score ranging from 0 to 48), and the Hospital Anxiety and Depression Scale (HAD) to assess anxiety and depression.
Results:

A total of 55 patients were included, of whom 37 (56.3%) were employed. The patients had axial radiographic SPA in 41.8% of cases, psoriatic arthritis in 41.8% of cases, and 16.3% had SPA associated with inflammatory bowel disease (IBD). The average disease activity scores for BASDAI and BASFI were 3.5 ± 1.2 and 3.9 ± 1.3, respectively. Twelve patients were on biologic treatment with anti-TNF agents. The WPAI showed that the average number of work hours missed due to SPA was 10.2 ± 8 hours, with an average absenteeism rate of 17.5 ± 1.9%. The overall impairment of health-related activities was 30 ± 4.4%. The average WALS score was 18 ± 2.7. A significant negative correlation was found between the WALS score and disease activity ($r = -0.35$; $p = 0.02$). The average depression score was 7.98 ± 3.5, and the average anxiety score was 10.21 ± 5 [0-20], with 34.5% showing no anxiety, 20% showing doubtful anxiety, and 45.4% having definite anxiety. A significant association was found between disease activity and the WALS score, with increased disease activity and worsening health status significantly associated with greater impairment of productivity and professional activity. Our study showed a significant association between impaired productivity and anxiety-depressive disorders in our patients ($r = 0.16$; $p = 0.02$).
Conclusion:
Our study suggests that patients with SPA tend to experience a decrease in their work productivity, which is closely associated with anxiety-depressive disorders and impaired quality of life.

P1273

IMPACT OF ILLNESS COGNITION ON THE WELL-BEING OF WOMEN WITH AUTOIMMUNE DISEASES

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Background:
Chronic inflammatory rheumatic diseases (CIRD) have a significant impact on quality of life. This study aims to explore how disease perception and self-esteem influence the well-being of women of reproductive age with CIRD.
Objectives:
The aim of this study is to explore how disease perception and self-esteem influence the well-being of women of reproductive age suffering from chronic inflammatory rheumatic diseases (CIRD).
Methods:
An observational, cross-sectional, and descriptive study was conducted with women of reproductive age (18-50 years) suffering from rheumatic diseases in a rheumatology department. Three questionnaires were used: The Illness Cognition Questionnaire (ICQ), a 18-item questionnaire assessing three dimensions—helplessness, acceptance, and perceived benefits, each with a scoring range of 6 to 24; the WHOQOL-Bref, a 26-item quality of life scale ranging from 26 to 130 (higher scores indicate better quality of life); and the Rosenberg Self-Esteem Scale (RSE), a 10-item scale with scores ranging from 10 to 40 (higher scores indicate better self-esteem).
Results:
A total of 92 women with CIRD were included, with a mean age of 39.7 ± 5.017 years. The patients were diagnosed with rheumatoid arthritis (45.6%), psoriatic arthritis (21.7%), axial spondyloarthritis (16.3%), and systemic lupus erythematosus (16.3%). The average ICQ score was 48.7 ± 7.36, with the acceptance dimension score averaging 25.9 ± 11.2. The mean WHOQOL score was 87.53 ± 16.21, and the RSE score was 24.5 ± 3.8. A significant correlation was found between the perceived benefits of the disease and quality of life ($p < 0.001$, $r = 0.7$) and self-esteem ($p < 0.001$, $r = 0.51$). Helplessness was significantly correlated with quality of life ($p = 0.001$, $r = -0.42$) and self-esteem ($p < 0.001$, $r = -0.73$). Disease acceptance was significantly correlated with quality of life ($p = 0.02$, $r = 0.59$) and self-esteem ($p = 0.01$, $r = 0.42$). A significant correlation was found between disease acceptance and the number of years of education ($p = 0.03$, $r = 0.21$).
Conclusion:
Our results show that positive disease perception and good self-esteem are associated with better quality of life in women with CIRD.

P1274

3D PRINTING FOR ASSESSING BONE STRENGTH AND RIGIDITY IN PUNCHING SPORTS: A FOCUS ON TOMOGRAPHIC INDICATORS

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Introduction and Hypothesis. Punching sports like Muay Thai (MT) demand high skeletal strength and resilience. This study hypothesizes that bone strength index (BSI) and cortical density (CtD) are significantly higher in MT practitioners compared to non-practitioners and correlate strongly with bone strength and rigidity as measured through 3D-printed models.
Methodology. Third metacarpals were scanned using XCT 2000 tomography in two groups: control (C) and MT practitioners. Based on these scans, 3D bone models were printed in PLA (0.2 mm nozzle) and tested in three-point bending (5 mm/min displacement rate) to determine fracture load (Wf), flexural strength (Rf), and modulus (Ef). Peripheral quantitative computed tomography (pQCT) was used to measure CtD, cortical area (CtA), cortical content (CtC), moment of inertia (MI), and BSI (CtD × MI).
Results. ANOVA revealed significant group differences in Wf, Ef, Rf, and BSI ($0.01 < p < 0.05$). Regression analysis showed BSI as the best predictor of Wf ($R^2 = 0.82$ for MT; 0.92 for C), while CtD was strongly associated with Rf ($R^2 = 0.83$ for MT; 0.93 for C), both with $p < 0.01$.
Interpretation. BSI reflects both density and structural distribution, making it a strong predictor of Wf. CtD emphasizes cortical bone quality, strongly predicting Rf due to its dependence on material properties.
Practical application. BSI and CtD are essential for monitoring bone health and optimizing training programs. Impact exercises enhance BSI, while resistance training increases CtD. 3D printing provides a non-invasive method to study bone adaptation. Future advancements, such as hydroxyapatite composites, could further enhance these applications.
Conclusions. BSI and CtD enable precise evaluations of bone strength and rigidity, guiding performance-enhancing and injury-prevention strategies in punching sports. The integration of 3D printing represents an innovative and practical approach to non-invasive bone health assessment.

P1275

MUSCLE OXYGENATION CHARACTERISTICS OF HEALTHY AND SARCOPENIC FRAIL ELDERLY PEOPLE

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Objective. To investigate muscle oxygenation responses during rest, exercise and passive recovery in healthy and sarcopenic frail elderly people.
Material and Methods. A total of 61 subjects, aged 78.89±7.44 years old, participated in this study. Participants were divided into groups: group I (n=50) - healthy persons and group II - persons with sarcopenia and frailty (n=11). The age, height, body mass, and body mass index (BMI) were homogenous in both groups. Sarcopenia was defined according to the criteria of the European Working Group on Sarcopenia in Older People in 2018 (EWGSOP2). Frailty status was determined using Fried's criteria. A near-infrared spectroscopy (NIRS) monitor was placed on the Vastus Lateralis muscle (10 cm above the proximal border of the patella). After warming up, participants performed an aerobic standard physical load on an ergometer for 6 minutes, with an intensity of 60 W and a revolution of bicycle 60. The oxygenation level of exercising muscle saturation (oxygenated haemoglobin - SmO_2, %) was recorded after 5 min of resting time in a sitting position, at the end of 6 min of aerobic physical load and every minute of passive recovery (5 min.) Heart rate (HR) responses were assessed with a telemetric HR monitor.
Results. The study showed that SmO_2 during the resting time significantly differed between the two groups (77.88±16.6 and 35.09±7.43 %), as well as, SmO_2 differed at the end of the standard physical load (68.06±19.75 and 26.00±11.14 %) and after 5 min recovery (77.55±16.18 and 46.09±11.21 %) ($p< 0.001$). However, the decrease in SmO_2 at the end of the standard exercise was similar in both groups 9-10%. The current results show that during recovery, SmO2 in a group with sarcopenia and frailty reached an 11% higher level than SmO_2 was before exercise.
Conclusions. Persons with sarcopenia and frailty have significantly lower muscle oxygenation at rest and the end of standard physical exertion. It can provide valuable insights as internal predictors of muscle metabolic changes. However, this area requires further research.
This project has received funding from the Research Council of Lithuania (LMTLT), agreement No S-MIP-22-36.
Keywords: sarcopenic frail, elderly people, muscle oxigenation.

P1276

PERIOPERATIVE BONE OPTIMIZATION IN ARTHROPLASTY, ¿HOW ARE WE IN MÉXICO TWO YEARS OF COMMUNITY OUTREACH?

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Background
In recent years, evidence has emerged that osteoporosis is a risk factor for arthroplasty complications. However, this has not affected the perioperative osteoporosis treatment rate.
In other countries, such as México, the osteoporosis treatment rate before arthroplasty was about 4%. (3)
Materials and methods
A group of seven national societies (FEMECOT, AMMOM, ACOMM, SCCOT, SECOT, SEFRAOS, SEIOMM.) developed a joint statement position on the diagnosis of osteoporosis and perioperative bone optimization in candidates for arthroplasty: "Perioperative Bone Optimization in Arthroplasty" "POBO." After that, FEMECOT´s Osteoporosis Committee and AMMOM started a community outreach in regional and national meetings.
To assess the impact of the diffusion, the research group of SMIOT (Mexican Society of Orthopedics and Trauma Research) launched a 12-question online questionnaire about POBO. The questionnaire was distributed through the Official FEMECOT e-mail twice (October and November 2024), and the results were analyzed in December 2024.
Conclusions.
We gathered 120 surveys, encompassing orthopedic surgeons from 26 out of 32 states. Of these, 36% were high-volume surgeons, and 97% were orthopedic surgeons with more than 5 years of experience.
Of the respondents, 71% say they change their surgical criteria if they find bad bone quality. However, we found that only 53% of the surgeons do a POBO. In their protocols, 64% include more than 3 Bone loss-related factors, 78% include DXA, 27% 25OHD, 11% FRAX, 5% Bone turnover markers, and 6% X-ray measures. Of the ones that don't perform any POBO, 46.4% are because they don't have the infrastructure in their settings.
A good thing is that the respondents say that if they found Bad bone quality during surgery, 82% initiated POBO or sent the patient to the osteoporosis specialist. After diagnosing osteoporosis, 83% will start pharmacological treatment.
This type of outreach can dramatically increase the number of patients diagnosed and treated during the perioperative period.
We must also prepare the health system to make these protocols actionable in all settings.
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Acknowledgments: We thank all the FEMECOT´s orthopedic surgeons who participated in this survey.

P1277

EVIDENCE-BASED JOINT STATEMENT POSITION OF PERIOPERATIVE BONE OPTIMIZATION IN THE ARTHROPLASTY CANDIDATE, FROM 7 NATIONAL SOCIETIES

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Background
The prevalence of arthroplasty is increasing. Nearly two thirds of patients undergoing elective arthroplasty procedures have low bone mineral density (LBMD), among those, only 32.8% were receiving treatment at the time of surgery. (1)
In recent years, evidence that defines osteoporosis as a risk factor for arthroplasty complications has emerged. However, it has not affected the perioperative osteoporosis treatment rate. (2)
Bone quality is underestimated and undertreated prior to elective arthroplasty.(3)
Materials and methods
A group of 7 national societies (FEMECOT, AMMOM, ACOMM, SCCOT, SECOT, SEFRAOS, SEIOMM.) developed a joint statement position on the diagnosis of osteoporosis and perioperative bone optimization in candidates for arthroplasty. "Arthroplasty Bone Optimization"
A scoping review of the available literature was performed, followed by a systematic review and meta-analysis. Subsequently, a Delphi Modified method was used to gather the different positions.
Results and recommendations

Recommendation 1: Patients scheduled for elective arthroplasty should undergo a bone health assessment (BHA).
Experts' concordance: 100%
This assessment should evaluate risk factors and clinical signs of osteoporosis and low bone quality. Additionally, a bone mineral density (BMD) DXA scan should be performed for those with one or more risk factors for osteoporosis, meeting ISCD or regional indications for DXA testing.
Recommendation 2: If poor bone quality is observed during surgery and a bone health assessment has not been conducted promptly, a complete BHA, including a DXA scan, is imperative.
Experts' concordance:71.4%
Recommendation 3 In the arthroplasty candidate, If LBMD or osteoporosis are noticed, bone loss related factors should be corrected, and appropriate treatment for osteoporosis should be started before or right after arthroplasty.
Experts' concordance: 90.5%
The use of Anti-resorptive and bone anabolic agents have been shown to reduce periprosthetic bone loss, complications and non-septic revision rates after joint arthroplasty
Recommendation 4: In arthroplasty candidates, the diagnosis of osteoporosis or low bone mineral density (LBMD) should not delay the surgery.
Position 5: Monitoring axial and periprosthetic bone mineral density through DXA protocols can help identify bone loss in central and periprosthetic areas in patients with risk factors or osteoporosis.
Experts' concordance: 83.3%
CONCLUSIONS
Perioperative bone optimization is an approach that should be considered in all patients who are candidates for arthroplasty. We encourage the orthopedic surgeon and multidisciplinary team to diagnose and treat the arthroplasty candidate's bone by screening for bone-loss-related factors, diagnosing osteoporosis, and starting treatment. Following these recommendations could lower PPBL, complications, and aseptic revision rates after arthroplasty.
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P1278

EQUIVALENCE TRIAL OF PROPOSED DENOSUMAB BIOSIMILAR BMAB-1000 AND REFERENCE DENOSUMAB IN POSTMENOPAUSAL OSTEOPOROSIS: THE DEVOTE STUDY

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Objective: To compare the efficacy, safety, pharmacodynamics (PD), pharmacokinetics (PK), and immunogenicity of Bmab-1000 (a biosimilar to denosumab) and denosumab (Deno) in women with postmenopausal osteoporosis (PMO).
Material and Methods: Overall, 479 women (mean age, 66.6 years) with osteoporosis [with lumbar spine (L1-L4) absolute bone mineral density (LS-BMD) and T-score ≤−2.5-≥−4.0] were randomized 1:1 to 60 mg of Bmab-1000 (n=238) or Deno (n=241) subcutaneously. Part 1 (week 0-52) was double-blind and active-controlled, comparing Bmab-1000 to Deno (two doses on day 1 and week 26). In Part 2 (week 52-78), patients initially on Bmab-1000 continued Bmab-1000 at week 52; n=218. Patients initially randomized to Deno (n=208) were re-randomized to Bmab-1000 or Deno at week 52 (n=104 each). Part 1 evaluated the therapeutic and PD equivalence between Bmab-1000 and Deno using %change from baseline (%CfB) in LS-BMD at week 52 and area under the effect curve (AUEC) of serum C-terminal telopeptide of Type 1 collagen (sCTX) from baseline to 26 weeks. Part 2 monitored the safety of Bmab-1000 and Deno after transition from Deno to Bmab-1000 versus continuing Deno. Secondary analyses included additional efficacy, PK, safety, and immunogenicity parameters.
Results: Equivalence was demonstrated for the primary efficacy endpoint. The confidence intervals (CIs) for the difference in least square means (LSMs) in %CfB in LS-BMD at week 52 between Bmab-1000 and Deno were contained within the predefined margins (±1.45; LSM diff: 0.610, 95% CI: -0.095, 1.316). The sCTX AUEC up to 26 weeks for Bmab-1000 was similar to that observed following a single dose of Deno (geometric LSM ratio: 104.14; 95% CI: 97.76, 110.95). The secondary efficacy, PD, PK, safety, and immunogenicity results were comparable among all groups up to Week 78, including after transitioning to Bmab-1000 from Deno.
Conclusion: Bmab-1000 demonstrated equivalent efficacy and PD to Deno in women with PMO with similar safety, tolerability, and immunogenicity profiles. There was no effect of transition from Deno to Bmab-1000.

P1279

BONE MINERAL DENSITY IN FEMALE PATIENTS WITH HIP FRACTURES AND INFLUENCE OF PREVIOUS FRACTURES

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Introduction: Osteoporotic fractures are often low-energy and occur spontaneously or when falling from a height while standing or sitting. The most common osteoporotic fractures are fractures of the wrist, spinal vertebrae and hip.
The aim of the study is to examine the bone density (BMD) in female patients with a hip fracture that occurred spontaneously or when falling from a height while standing or sitting, and to determine the existence of the influence of previous fractures on bone density values.
Material and methods: The study included 94 menopausal patients who were rehabilitated at the "Niška Banja" Institute in the period from January 1, 2023. until 31.12.2024. after operative or conservative treatment of hip fracture. All patients were in menopause, and the average age was 75.05+6.23 years. The control group was represented by 83 women, also in menopause, without fractures, average age 72.28+5.37 years. In all subjects, BMD was measured (spine and hip) using the DXA method on the Hologic device.
Results: The average value of BMD on the lumbar spine in the examined group was 0.740+0.12g/cm2, T-score -2.7+0.86, and in the control group 0.824+0.25g/cm2, T-score -1.92+0.93. On the hip in the examined group, the average value was 0.580+0.13g/cm2, T-score -2.9+0.97, and in the control group 0.655+0.23g/cm2, T-score -2.1+0.94. A highly statistically significant difference was obtained between the absolute values of BMD both at the lumbar spine in the tested and control groups ($p<0.001$) and at the hip ($p<0.001$). The difference was statistically significant between the cross-sectional T-score values at the lumbar spine and hip in the test and control groups. In the examined group (n=94), 21 patients had a previous fracture, in 15 cases on the forearm (fractura radii loco typico), in 4 on the lower leg, and in 3 cases on the second femur. Comparing the mean values of BMD between the group with one fracture (n=73) and the group that had a previous fracture (n=21), we found that the BMD in the lumbar spine and hip was lower in the group with a previous fracture, and the statistical significance present only for hip BMD ($p<0.05$).
Conclusion: The obtained results confirm the influence of bone density on the occurrence of hip fractures, and along with bone density, previous fractures represent an important risk factor for future fractures.
Key words: osteoporotic fractures, bone density, female patients.

P1280

FACTORS INFLUENCING SF-12 HEALTH-RELATED QUALITY OF LIFE SCORES IN ADULTS WITH OSTEOARTHRITIS

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Introduction :
Osteoarthritis (OA) is a degenerative joint disease that significantly impacts an individual's quality of life. As it progresses, these symptoms can limit a person's ability to perform daily tasks . The quality of life of patients with osteoarthritis is altered not only by the physical discomfort but also by the psychological and social consequences .
Objectives :
The aim of the study was to predict the associated factors to a poor quality of life in patients with knee osteoarthritis and Osteoarthritis of the hand .
Methods :
This was a cross-sectional study including patients followed in the Rheumatology department for osteoarthritis. We used the short form SF-12 questionnaire to assess the quality of life. The statistical analysis was done by SPSS software.
Results :
Our study included 72 patients: 77,8% women and 22,2% men with a mean age of 68 ± 8.79 years [50-91]. Most common comorbidities were hypertension(59,7%) , diabetes (33,3%) , cardiac disorders (23,6%) , osteoporosis (27,8%) and rheumatoid arthritis (13,9%). The average BMI was 35.17 ± 5,21 [26- 39]. knee osteoarthritis was isolated in 61,1% , and associated to Osteoarthritis of the hand in 38,9% . The average mental quality of life score was 46,97 ± 18,15. The average physical quality of life score was 48,12 ± 14,17. Both were below the average health status. A positive correlation was found between the assessment of a poor physical (PCS) quality of life and young age(p=0,02) , female sex (p=0,03) ,presence of deformities (p=0,03) , and an advanced stage of Kellgren and Lawrence (p=0,02). A poor mental quality of life (MCS) was associated to comorbidities such as hypertension (p=0,04) , rheumatoid arthritis (p=0,04) and the presence of heberden nodes (p=0,03). Both physical and mental quality of life were more altered in patients with Osteoarthritis .
Conclusion :
A comprehensive approach of osteoarthritis and the associated factors to a poor quality of life is the key to manage and enhance those affected by this chronic disease .
Ethics :
Key words :

P1281

TYPES OF ATTITUDES TO ILLNESS IN PATIENTS WITH SYSTEMIC SCLEROSIS

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Aims: To study the peculiarities of attitude to their disease formation in patients with systemic sclerosis (SS).
Materials and methods: 54 patients with SS were examined. The questionnaire "Type of attitude to the disease", created in the laboratory of clinical psychology of the V.M. Bekhterev Research Institute based on clinical and psychological typology of attitude to the disease, proposed by A.E. Lichko, was used.
Results: Table 1 shows the distribution of the basic attitude to the disease depending on the activity of the pathological process.
Table 1. Distribution of the basic attitude to the disease in SS patients depending on the degree of activity

Attitude to the disease types	I degree activity (n=12)	II degree activity (n=37)	III degree activity (n=5)
Harmonious (7,4%)	3,7%	3,7%	-
Ergopathic (37%)	9,2%	25,9%	1,85%
Anxious (33,3%)	7,1%	18,5%	7,4%
Hypochondriac (37%)	1,85%	27,75%	7,4%
Neurasthenic (18,5%)	3,7%	12,95%	1,85%
Melancholic (11,1%)	3,7%	5,5%	1,85%
Sensitive (46,2%)	9,25%	29,9%	7,4%
Egocentric (14,8%)	-	9,25%	5,5%

As our research has shown, the anxious, hypochondriac, and sensitive variants were determined more often in patients with SS with increasing severity of the condition. These types of attitudes to the disease determine the hypernosognostic reaction to the disease - the patient has an excessively bright emotional coloring of experiences related to the disease, while an underestimated model of the expected results of treatment is formed. Emotional and affective sphere of relations in such patients is manifested in maladaptive behavior: reactions like irritable weakness, anxious, depressed state, "withdrawal" into the disease, refusal to fight - "capitulation" to the disease, etc. Sensitive attitude to the disease is also manifested by maladaptive behavior of patients: they are embarrassed about their disease in front of others, "use" it to achieve certain goals, build paranoid concepts about the causes of their disease and its chronic course, show heterogeneous aggressive tendencies, blaming others for their illness.
Conclusion: Assessment of personal reactions to the disease, closely related to the quality of life and adherence to treatment is an important element of successful therapy of the patient with SS.

P1282

THE EFFICACY OF SARCOMEAL® ORAL SUPPLEMENTATION PLUS VITAMIN D3 ON MUSCLE1 PARAMETERS, METABOLIC FACTORS, AND QUALITY OF LIFE IN DIABETIC SARCOPENIA: A RANDOMIZED CONTROLLED CLINICAL TRIAL

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Abstract
Aim: To investigate the efficacy of Sarcomeal® sachet, as a protein supplement, plus vitamin D3 on muscle parameters, metabolic factors, and quality of life (SarQoL) in individuals with diabetes and sarcopenia.
Methods: Sixty individuals were randomized into the control or intervention group. The intervention group received a daily dose of one Sarcomeal sachet including; whey protein, creatine, glutamine, branched-chain amino acids (BCAAs), hydroxy-methyl-butyrate (HMB), and 1000 IU of vitamin D and both groups were recommended to consume protein-rich food, be educated about the disease, and perform physical activity for 12 weeks. Various assessments including muscle parameters, blood tests, and SarQoL were conducted at the beginning and the end of the trial.
Results: Over 12 weeks, although the intervention group had significant improvements in mean skeletal muscle mass index (SMI) (change: 0.17 [0.016, 0.329] kg/m²; p<0.05) and handgrip strength (change:1.33[0.256, 2.410] kg; p<0.05), differences between groups were not statistically significant. However, significant improvements were observed in lean mass (1.70 [0.749, 2.665] kg; P<0.01) and lean mass index (0.62[0.287, 0.954] kg/m²; P<0.01) between groups. Weight was maintained in the intervention arm, whereas the control arm experienced significant weight loss (1.87 [0.654, 3.109] kg; P<0.01). Participants in the intervention arm did not show significant changes in blood parameters. The mean difference of total SarQol scores between two groups reached statistical significance [mean difference: 13.04 (2.73-23.34); P < 0.05]. There were the significant means difference the activities of daily living (ADL) domain and body composition domain of SarQoL.
Conclusion: The Sarcomeal supplement significantly improved lean muscle mass, preserved physical function, and helped maintain weight, supporting its potential as a strategy to counter muscle loss and enhance the QoL in diabetic sarcopenia patients.

P1283

IRAN SARCOPENIA REGISTRY: PROTOCOL FOR A NATIONWIDE REGISTRY FOR ENHANCED RESEARCH AND MANAGEMENT

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Abstract

Background: Sarcopenia has emerged as a pressing issue in the context of global aging trends, due to its profound impact on physical function, quality of life, and healthcare systems. The establishment of national registries dedicated to sarcopenia, such as the Iran Sarcopenia Registry (ISR), is a pivotal step for systematically addressing this growing health challenge through enhanced research and informed decision-making.

Methods: ISR is a prospective cohort study, overseen by Tehran University of Medical Sciences, designed to sequentially enroll individuals diagnosed with sarcopenia across Iran while ensuring uniformity in data collection. The registry adopts a non-interventional approach, allowing patients to receive standard care without interference from the registry team. The target population comprises individuals diagnosed with sarcopenia, identified based on diagnostic criteria with cutoff values specifically tailored to the Iranian population. Comprehensive measurements such as demographic data, sarcopenia-specific assessments (e.g., muscle mass, muscle strength, and physical performance), medical history, and lifestyle factors will be recorded. A range of validated tools are employed to assess physical activity, nutritional status, and quality of life. Blood tests alongside anthropometric and functional assessments will also be documented.

Conclusion: Through its comprehensive data collection, ISR aims to enhance understanding of the risk factors and clinical outcomes associated with sarcopenia among Iranian adults. By facilitating integrated data collection, the ISR seeks to support the development of evidence-based decisions and policies to improve the health and quality of life of older adults.

P1284

SUBSEQUENT FRACTURE AND MORTALITY AFTER PROXIMAL HUMERUS OSTEOPOROTIC FRACTURE IN PATIENTS INCLUDED INTO A FLS IN SPAIN

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Objective

Fragility fractures increase morbidity and mortality and are an important risk factor for a future fracture. Much attention has been paid to hip and vertebral fractures due to the high impact on subsequent fracture, morbidity and mortality associated to them, as well economic burden. In contrast, few data have been shown for proximal humerus fractures (PHF) despite being the third most commonly observed FF in elderly patients and the second most common upper extremity fractures. The purpose of this study was to investigate the incidence of subsequent fracture and mortality following a proximal humerus fracture.

Material and Methods

This is a prospective study of patients aged 50 years or older who sustained a low energy proximal humerus fracture and were included in a FLS between January 2017 and December 2023). Standard follow-up of 2 years was carried out by consultation at 6 months, 1 year and 2 years after inclusion. Uni and multivariate models were used to evaluate potential risk factors for re-fracture and mortality. Data obtained included patient demographics, previous fractures and falls, comorbidities, fracture risk assessment by FRAX® tool, history of previous anti-osteoporotic treatment, estimated daily calcium intake and vitamin D blood levels.

Results

A total of 372 patients with PHF were available for analysis. Mean age was 81.4 years old, 81.8% females and 18.2% males. A total of 49 subsequent fractures were recorded (6-year cumulative incidence of 6.61%). Re-fractured patients were women in 95.9% of cases, with a mean age of 80.2 years. Subsequent fractures were located in the wrist (26,5%), hip (20,4%), proximal humerus (18,3%), vertebra (14,3%), pelvis (6,1%) and other skeletal sites (14,3%). Cumulative mortality during the 6-year period was 4,91%. Anti-osteoporotic drugs were initiated in 301 patients (80.9%) and 311 patients (83.6%) received calcium/vitamin D supplements. Several variables were evaluated to identify potential risk factors for subsequent fracture and mortality in these patients.

Conclusions

Inclusion of patients with proximal humeral fractures into an FLS increases the percentage of patients initiating anti-osteoporotic drugs after fracture. Re-fracture was more common in women aged >80 years, and wrist was the most common skeletal site of re-fracture. A significant reduction in the incidence of subsequent fractures and mortality has been observed when patients are included into a secondary fracture prevention programme.

P1286

THE SYSTEMIC INFLAMMATION RESPONSE INDEX (SIRI) IS INDEPENDENTLY ASSOCIATED WITH INCIDENT FRACTURE RISK IN OLDER SWEDISH WOMEN

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Objectives
This study aimed to explore the association between fracture risk in the elderly and the systemic inflammation response index (SIRI), linked to various health outcomes including osteoporosis.
Material and Methods
In a Swedish cohort of 2965 women aged 75-80 years, baseline examinations included blood analyses, DXA, HR-pQCT, physical function tests, and questionnaires. The participants were followed prospectively regarding incident fractures and death. The SIRI was defined as blood counts of neutrophils x monocytes/lymphocytes.
Results
The median follow-up time was 8 years, and 230 hip fractures, 790 major osteoporotic fractures (MOF), and 1059 any type of fracture occurred. Higher levels of SIRI were linked to increased risks of hip fractures (HR per 1 SD increase 1.18, 95% CI [1.07-1.32], p=0.002), major osteoporotic fractures (MOF; 1.10 [1.03-1.18], p=0.003), and any fractures 1.11 [1.05 to 1.17], p<0.001) independent of age, BMI, clinical risk factors (CRFs), and femoral neck BMD. SIRI was related to poorer physical function and activity levels and higher prevalent fall rates. SIRI showed limited associations with bone parameters measured by DXA and HR-pQCT. Higher levels of SIRI were associated with a more favorable trabecular structure and density but increased cortical porosity.
Conclusion
We conclude that SIRI is positively and independently associated with incident fracture risk, highlighting the potential of evaluating SIRI as a tool in fracture risk prediction.

SIRI and physical function, DXA, and HR-pQCT.

	Q1 (n=592)	Q5 (n=599)	p
TUG (s)[y]	8.2 (3.0)[a]	9.7 (4.1)[a]	<0.001
PASE[z]	115.4 (53.4)[a]	90.0 (49.2)[a]	<0.001
Fall (≥1 last 12 months, n [%])	153 (25.8)[a]	203 (33.9)[a]	0.006
FN BMD (T-score)	-1.59 (0.88)	-1.68 (0.92)	0.468
Lumbar BMD (T-score)	-1.05 (1.54)	-0.88 (1.58)	0.168
HR-pQCT:	n=488	n=457	
Trabecular vBMD (mg/cm^3)	118.7 (37.8)	124.1 (42.7)	0.004
Trabecular separation (mm)	0.58 (0.20)	0.56 (0.23)	0.034
Trabecular number (mm^{-1})	1.69 (0.40)	1.76 (0.44)	0.003
Cortical porosity (%)	4.38 (2.10)	4.75 (2.34)	0.002

The mean (SD) of the physical function, DXA, and HR-pQCT (ultra-distal radius) parameters are shown for the lowest (Q1) and highest (Q5) SIRI quintiles. P-values from ANOVA across all quintiles.
[a] Significant (p<0.05) difference between Q1 and Q5. [y]n=2941, [z]n=2952.
Abbreviations: TUG, timed up-and-go; PASE, physical activity scale in the elderly.

P1287

EFFECT OF DUAL TASK TRAINING VERSUS ANALOGY TRAINING ON GAIT SPEED AND BALANCE IN OLDER ADULTS – RANDOMIZED CONTROLLED TRIAL

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Background: Walking performance is commonly affected due to decline in cognitive and motor functions, in elderly, which result in reduced speed, longer strides, and more variability in stride length. Enhancing gait can benefit from cognitive methods including attentional tactics, self-instruction strategies, or the use of external signals.
Objectives: This study intends to find out the effect of dual training, analogy training on gait speed and balance in older adults.
Methods: This three arm parallel, single blinded randomised control trial was conducted, 116 participants screened out of which 69 individuals (age 60 -75 years) allocated into 3 groups with the allocation ratio of (1:1:1), Group A Dual task training, Group B Analogy training, Group C control group. Exercise sessions were 45 mins for 3 days per week for 4 weeks. For assessment Time up and go test, Modified fall efficacy scale, Activity specific balance confidence scale, Tinetti's Performance oriented mobility assessment scale taken pre and post.
Results: To find out difference between the groups, Mann Whitney U test was performed and within the group analysis was done by Wilcoxon sign rank test. Time up and go test shows significant improvement in group A (P=0.02). 10-meter walk test shows significant improvement in preferred walking speed, maximum walking speed and activity confidence in Group B (P=0.0001) .
Conclusion: This study concludes that analogy training was superior to dual task training and control group and can be administered as an effective mode of gait rehabilitation to improve gait speed and balance in elderly.
Clinical implications: Analogy training and dual task training can be used as gait rehabilitation in older adults.
Keywords: Analogy training, dual task training, gait rehabilitation, geriatric, walking speed and balance.

P1288

TARGETING OSTEOCLASTOGENIC TH9 CELLS : A NOVEL APPROACH TO COMBAT INFLAMMATORY BONE LOSS IN POSTMENOPAUSAL OSTEOPOROSIS

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Recent research has uncovered a significant role for IL-9-producing Th9 cells in various inflammatory diseases. However, little is known about how Th9 cells contribute to the etiology of inflammatory bone-loss in post-menopausal osteoporosis (PMO). Our study delves into the impact of Th9 cells on postmenopausal osteoporosis (PMO). We observed that IL-9 has a pathological impact on inflammatory bone-loss in ovariectomized (Ovx) mice. Our in-vivo data revealed that estrogen deprivation triggered a pro-inflammatory cascade, upregulating IL-9 and IL-17, culminating in significant bone loss in Ovx mice. Both our ex-vivo and in-vivo studies corroborated these findings in Ovx mice, as estrogen attenuates IL-9's effect on the differentiation of Th17-cells as well as the potential of Th9-cells to produce IL-9. Mechanistically, Th9-cells in an IL-9-dependent manner enhance osteoclastogenesis and thereby establish themselves as a novel and independent osteoclastogenic Th-subset. Blocking IL-9 improves bone-health in Ovx-mice by inhibiting the differentiation and function of both osteoclasts and Th9/Th17-cells. Our clinical findings further attested to the osteoporotic role of Th9-cells in post-menopausal osteoporotic human subjects. Collectively, our data establish IL-9-producing Th cells as a pivotal regulator of bone loss in post-menopausal osteoporosis, highlighting the therapeutic potential of targeting the IL-9/Th9 axis for the management of this condition.

P1289

CHANGES OF TOTAL AND FREE TESTOSTERONE BLOOD LEVELS DUE TO AN 18 MONTHS HIGH INTENSITY RESISTANCE EXERCISE TRAINING IN OSTEOSARCOPENIC SENIORS

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Objective(s): Testosterone is an anabolic hormone that may counteract the age-related decline in muscle mass and function. It has been already shown that testosterone blood levels are directly increased by both high- and moderate-intensity exercise. However, it remains unclear whether these short-term elevations lead to an overall increase in basal testosterone levels after prolonged excercise.
Material and Methods: This is an exploratory analysis of data of the Randomized Controlled Franconian Osteopenia and Sarcopenia Trial (FrOST) in which community-dwelling men over 70 years of age with a skeletal muscle index (SMI) ≤ 7.26 kg/m^2 and a bone mineral density T-Score ≤ -1 SD at the lumbar spine or the proximal femur as measured by dual-energy X-Ray absorptiometry (DXA) were included. These osteosarcopenic men were randomly allocated to a consistently supervised high-intensity resistance exercise training (HIT-RT) (n = 21) or an inactive control group (CG, n = 22). HIT-RT scheduled a single set protocol with high-intensity twice a week for 18 months. Both groups received Vit-D (800 IE/d), calcium (1,0 mg/d) and whey-protein (CG: 1.2 vs. HIT-RT: 1.5–1.7 g/kg/d) as supplements. Blood was drawn after an overnight fast total testosterone and sex hormone-binding globulin (SHBG) were measured and free testosterone was calculated.
Results: 29 men (age 79.7 ± 4.7 years) could be included in this analysis. HIT-RT (n = 15) and CG (n = 14) exhibited no significant differences for all analyzed parameters at baseline (all $p > 0.05$). After 18 months of intervention leg extensor strength, handgrip strength as well as SMI improved significantly in the HIT-RT compared to the CG (all $p < 0.01$). This gain in muscle mass and strength was not accompanied by higher levels of total and free testosterone or changes of SHBG (all $p > 0.05$).
Conclusion(s): Even though long-term HIT-RT improved muscle mass as well as strength it did not change basal levels of SHBG as well as total and free testosterone.

P1290

IMPROVEMENTS IN BMD FOLLOWING TREATMENT WITH ROMOSOZUMAB FOR PEOPLE AT HIGH FRACTURE RISK; REAL WORLD OUTCOMES FROM NHS GREATER GLASGOW & CLYDE

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Introduction
Romosozumab is a monoclonal antibody that binds and inhibits sclerostin resulting in increased bone formation and fracture risk reduction in patients with osteoporosis. The FRAME study demonstrated a reduction in vertebral fracture (VF) by 70% and improvements in lumbar and hip BMD by 13% and 7% respectively (1).
Methods
The aim of this study was to identify patients within NHS Greater Glasgow & Clyde (GGC) treated with Romosozumab and assess BMD, adverse events and fracture occurrence. Data was collected retrospectively from electronic health records and DXA between September 2022 and September 2024.
Results

Within NHS GGC, 109 patients were commenced on Romosozumab and 58 patients completed 12 months of treatment.
The mean age was 68.3 years (SD 7.4) and there was no history of CV disease. Lipids and BP were assessed in 85.3% and 61.5% respectively, and 48.6% had CV risk assessment using ASSIGN or QRISK3. Fracture history includes 80% with VF (n=87) and 54.1% (n=59) had long bone fractures. Additionally, 94.8% of participants had experienced a fracture in the preceding 24 months. Treatment-naïve patients accounted for 29.3% of the cohort.
Pre-treatment DXA demonstrated mean t-score at lumbar spine (LS), femoral neck (FN) and total hip (TH) of -3.44 (SD 1.0), -2.68 (SD 0.9) and -2.68 (SD 0.9) respectively, whilst mean BMD was 0.76 (0.133), 0.66 (0.107) and 0.68 (0.111) g/cm^2 respectively. Following 12 months of treatment, BMD improved at the LS, FN and TH to 0.85 ($p<0.001$), 0.67 ($p=0.004$) and 0.67 g/cm^2 ($p<0.001$) with t-scores of -2.66, -2.50 and -2.48 respectively ($p<0.001$). This represents an improvement in BMD of 12.73%, 3.83% and 4.04% respectively on post-treatment DXA in 57 patients.
Eight patients reported side effects (7.3%) including injection site discomfort, bone pain and headache. There were no CV events. Eleven patients sustained a fracture during treatment; six VF and five long bone fractures.

Conclusion

The results of this real world retrospective data collection demonstrate that Romosozumab is a well-tolerated and effective treatment for the management of osteoporosis and increased fracture risk. The improvements in BMD in our cohort are in keeping with those in the FRAME study.

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P1292

A CASE OF FEMORAL HEAD AVASCULAR NECROSIS

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Objective:Avascular necrosis (AVN) of the femoral head represents a pathological process characterized by the interruption of blood supply to the bone. Although the pathophysiology of hip AVN remains inadequately understood, it constitutes the final common pathway of both traumatic and non-traumatic factors that compromise the delicate circulation of the femoral head. Ischemia in the femoral head results in the necrosis of marrow and osteocytes, often culminating in the structural collapse of the necrotic segment. The condition was first documented by Munro in 1738. Initially asymptomatic, AVN eventually presents with pain and restricted motion, typically localized to the groin but potentially affecting the ipsilateral buttock, knee, or greater trochanteric region. Magnetic resonance imaging (MRI) is the diagnostic modality of choice for patients presenting with suggestive symptoms of AVN when radiographs appear normal.
Methods: A 60-year-old female patient, with a history of smoking, presented with a 3-4 month history of right hip pain. Notably, she reported a fall one year prior to the onset of pain, experiencing hip pain for several months thereafter, which eventually resolved. Despite administration of anti-inflammatory and anti-edematous therapies for the current episode, her pain persisted. Initial investigations, including comprehensive laboratory tests and plain radiographs of the lumbar spine and pelvis, led to a preliminary diagnosis of incipient coxarthrosis and lumbar disc herniation. Physical therapy was initiated; however, the patient's pain intensified, particularly during movement. Six weeks post-symptom onset, an MRI of the pelvis was performed, confirming a diagnosis of AVN. A dual-energy X-ray absorptiometry (DXA) scan indicated osteopenia.
Results: Following adherence to the preoperative protocol, the patient underwent surgical intervention involving the implantation of a total uncemented hip prosthesis on the right side, approximately three months after symptom onset. The operative and early postoperative courses were uneventful, succeeded by a regimen of physical therapy and balneotherapy.
Conclusion: Total hip arthroplasty remains a highly effective intervention for osteonecrosis of the femoral head in younger patients (aged 50 years or less), demonstrating favorable mid-term outcomes. In active young patients, survival rates of prostheses are reported to be 100% at 7-10 years postoperatively when utilizing ceramic-on-ceramic or highly cross-linked polyethylene bearing surfaces. Nevertheless, further research is warranted to ascertain long-term outcomes. Moreover, the presence of a hematological disorder, such as sickle cell disease, may elevate the incidence of complications and adversely affect implant survival rates.

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P1293

ASSOCIATION OF DURATION AND CUMULATIVE DOSE OF GLUCOCORTICOIDS WITH RHEUMATIC CACHEXIA

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Objective: To determine the association between glucocorticoid (GC) therapy and rheumatic cachexia (RC).
Methods: The study involved 110 patients with rheumatoid arthritis (RA) (102 women and 8 men). The diagnosis of RA was verified based on the ACR/EULAR criteria. The average age of patients was 54.4±12.6 years (hereinafter M±SD). The composite body composition of patients was determined using dual-energy X-ray absorptiometry with the Total Body program on a LUNAR DPX GE device. The diagnosis of RC was made with a lean mass index (LMI) below the 10th percentile and a fat mass index above the 25th for a given age. Reference values were determined according to the work of Coin et al., where these values were obtained in the Italian population. Statistical analysis was performed using the STATISTICA 12.0 software package.
Results: 25 patients (22.7%) with an average age of 52.2±8.14 years met the RK criteria. No statistically significant correlation was found between age and GC intake at the time of the study (p=0.412) and in the anamnesis (p=0.203). 88 patients had a history of GC use, including 20 with GC and a median cumulative GC dose of 8.5 g [6.2-17.5 g] and 68 without GC and a cumulative glucocorticoid (GC) dose of 5.8 g [3.6-13.7 g] (Z=-1.98; p=0.047]. 77 patients continued daily GC use, including 16 with GC and a median daily GC dose of 5 mg [4-8 mg] (hereinafter Me [Q1-Q3]), and 61 without GC and a GC dose of 8 mg [5-10 mg] (Z=2.58; p=0.01). The incidence of GC did not differ between patients with and without osteoporosis (32.1% vs. 24.6%, $\chi 2$=0.77, p=0.38).
Conclusion: RC was detected in 22.7% of patients with RA using dual-energy X-ray absorptiometry. The presence of RC was associated with an increase in the cumulative dose of GC. However, among patients who continued taking GC at the time of the study, RC was more common if the dose of the drugs was lower. At present, the only generally accepted method for increasing the volume of LMI and, as a result, combating RC is physical exercise. At the same time, it is also important to evaluate the total duration and volume of GC therapy, which can contribute to the development of RC.

P1296

WILTROM TRIPOD-FIX IMPLANTABLE TITANIUM VERTEBRAL AUGMENTATION DEVICE A NEW DEVICE IN THE TREATMENT OF OSTEOPOROTIC COMPRESSION FRACTURES FIRST RESULTS OF A SINGLE ARMED PROSPECTIVE STUDY

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Introduction
Balloon Kyphoplasty (BKP) is a commonly performed vertebral augmentation procedure for painful osteoporotic vertebral compression fractures (OVCFs). This study aimed to support the use of a new titanium implantable vertebral augmentation device (Tripod-Fix Vertebral Body Augmentation System).

Materials and Methods
Prospective, single armed, controlled study. Patients were required to meet the following eligibility criteria: one painful OVC F located between T5 and L5, failed conservative treatment, an Oswestry Disability Index (ODI) score ≥30/100 and a VAS score ≥60/100. Anterior vertebral body height, midline vertebral body height, and Cobb angle were measured preoperatively and postoperatively and at 3 and 6 months. Adjacent and subsequent fractures and safety parameters were recorded throughout the study. Cement extravasation was evaluated on X-rays.

Results
Among the 41 patients (31 female, 10 male, mean age 71.2±11.5 years) who underwent surgery. 28 patients completed the 6-month follow-up period. 1 patient developed an adjacent vertebral compression fracture.
The analysis of the primary endpoint showed a significant improvement in VAS and ODI scores.
Prior to treatment, the mean VAS was 85 mm compared to 15 mm immediately after the procedure, and 10 mm after 6 months. Significant Improvements in the Oswestry scores were registered after 6 months. The middle part of the vertebral bodies was increased by an average of 2.8 mm. The average kyphosis angle was improved.
No patient required surgical reintervention or retreatment at the treated level. No symptomatic cement leakage was reported. One adjacent fracture was documented and treated with Kyphoplasty.

Conclusion
The study results demonstrated an excellent risk/benefit profile for patients treated with the Tripod-Fix for up to 6 months.

P1297

CZECH NATIONAL POPULATION-BASED PROGRAM FOR EARLY DETECTION OF OSTEOPOROSIS: RESULTS AFTER 20 MONTHS

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Objective: International Osteoporosis Foundation published SCOPE 2021, that comprised a compendium of information available on the burden of osteoporosis and healthcare provision and uptake in the EU 27+2. The Czech Republic SCOPE scores resulted in a 6th place regarding disease burden and 26th place in combined healthcare provision. The Czech Republic belongs to the group of eight high-burden low-provision countries. Low number of DXA units and fact that osteoporosis is not primarily managed in primary care were both identified as main causes of overall low-provision. Therefore, major professional societies together with major health care payers have prepared and launched the Czech National Population-based Program for Early Detection of Osteoporosis since April 2023.We present data from the first 20 months of the program.

Methods: National algorithm for DXA indication and monitoring has been proposed. DXA units 20 per million, 1-2 per district was set as target. GP´s and gynaecologists were allowed to perform DXA scans based on mandatory training and have got access to anti-osteoporosis medication. Patients at risk indicated for DXA assessment are women aged 60 and men aged 70 and over. Furthermore, postmenopausal women up to age 59 and men aged 65-69, if their FRAX exceeds the lower assessment threshold. Specific codes determining BMD T-score ranges are used.

Results: January 2023 were 118 DXA units in Czechia, in 42 of 76 districts (56%), in January 2025 were approved 216 DXA units (183% increase) in 73 districts (96%), 19.85 DXA units per million. Within the period from April 2023 to December 2024 DXA was carried out in 167 022 women (92%), 86 % older 60 years and in 15 539 men (8%), 89.6% older 70 years. We identified 21.2% women and 11.7% men with T-score below -2.5.

Conclusion: the program improved availability of diagnostic care and provide population data. The program is a powerful systematic tool for the diagnosis and treatment of osteoporosis in Czechia.

P1298

AN ARTIFICIAL INTELLIGENCE ALGORITHM TO IMPROVE DIAGNOSIS OF VERTEBRAL FRACTURES EMBEDDED IN FRACTURE LIAISON SERVICES CAN REDUCE FRACTURES AND REDUCE COSTS

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Objective

To estimate the patient benefit and economic impact of integrating an artificial intelligence (AI)-enabled vertebral fracture (VF) identification algorithm into optimally-run FLSs.

Material and Methods

The Nanox-AI HealthVCF algorithm was implemented into the radiology workstream of three UK NHS hospitals. The AI analysed existing CT scans and flagged those with potential moderate/severe fractures for local clinical confirmation. Patients with confirmed scans were referred to the local FLS for further assessment and management. Using a microsimulation model[1], the impact of the AI on patient outcomes and health and social care costs was estimated for 1,000 male and 1,000 female patients with confirmed VF over five years. We used observed FLS performance metrics before and after AI implementation from the FLS-Database of England and Wales and expert opinion from FLS leads to populate the model comparing results under pre-AI observed FLS to AI optimised-FLS settings.

Results

Subsequent hip, spine or other major osteoporotic fractures were 6.8% and 4.4% lower under the AI + optimised FLS setting for female and male simulated patients, leading to 44 and 59 quality-adjusted life years gained, respectively. Less subsequent fractures led to lower health and social care resource use: AI + optimised FLS would save 378 bed days per 1,000 female patients and 206 per 1,000 male patients, with reduced need for long-term institutional care after a fracture by 17 and 12 fewer years of long-term institutional care, respectively. FLS costs including medication would be higher under the AI + optimised FLS but these would be offset, partially for males and entirely for females, by savings in health and social care leading to extra costs of £62 per male patient and savings of £117 per female patient over the five years. The difference was driven by higher risk of hip after VF for women compared to men.

Conclusion

While VF are common and put patients at high imminent fracture risk, FLSs have struggled to identify this subgroup. Despite differences in age and higher mortality, adding AI to flag potential vertebral fractures can lead to substantial reductions in subsequent fractures and in health and social care costs. These findings support the widespread integration of AI into FLSs as both clinically and cost-effective.

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Disclosures
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P1299

DISTINCT CLUSTERS OF CARERS WITH X-LINKED HYPOPHOSPHATAEMIA BASED ON THEIR QUALITY OF LIFE

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Objective
To investigate whether distinct clusters of people with X-linked hypophosphataemia (XLH) who are also carers of relatives with the same disease can be identified based on their quality of life.

Material and Methods
Patient-level data were obtained from the RUDY Study in the UK. Study participants with XLH who self-declared being carers of relatives with XLH completed the Caregiver oncology quality of life questionnaire (CarGOQol), composed of 29 items grouped into 10 dimensions: Psychological well-being, Burden, Relationship with health care, Administration and finances, Coping, Physical well-being, Self-esteem, Leisure time, Social support, and Private life. Each item was assessed on a 5-point Likert Scale, with (unweighted) scores calculated for each domain and in total (min 0, max 100), and higher scores indicating better quality of life.
Dissimilarity matrix calculated using Gower's distance was used to identify quality of life clusters of people with XLH. Agglomerative and divisive clustering were explored and dendrograms used to visually assess results. Final decision on number of clusters was made based on the elbow and silhouette methods.

Results
Of 59 adult XLH participants in the dataset, 13 reported being caregivers of a relative with the disease. They were mostly women aged around 40, nearly half of British or Northern Irish ethnicity, from most regions of the UK, and less deprived than the general population. Nearly half of caregivers looked after an adult and the other half after child, with the great majority being caregivers for 1 or 2 people.
Two distinct clusters were identified using divisive clustering, with Cluster 1 grouping six carers and Cluster 2 seven. Cluster 1 participants reported higher mean scores than those in Cluster 2 (Figure 1) in all but three domains (Relationship with health care, Self-esteem, and Social support) and in overall quality of life (68.0 vs. 43.2).

Conclusion
The study confirms a significant and variable impact of caring on the quality of life of people with XLH who look after relatives with the disease. Further work is needed to understand the determinants of carer burden and the need to personalise carer support in the XLH setting.

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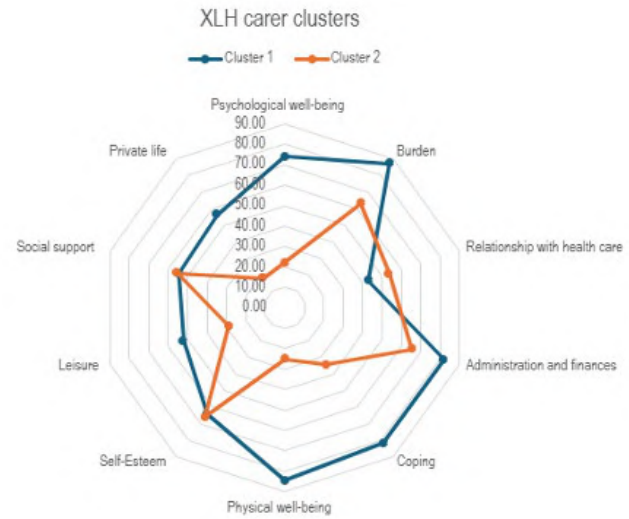
RUDY team and study participants. Funded by Kyowa Kirin.

Disclosures
MKJ: Grant (UCB, Kyowa Kirin); Consultant (UCB, Amgen, Kyowa Kirin, Nanox-AI, Naitive Technologies, Theramex). MTSS: Consultant (Theramex). RPV: Consultant (UCB, Mereo).



P1300

BRIDGING THE BONE HEALTH GAP: INSIGHTS FROM THE NSHF SPINE & BONE HEALTH TASK FORCE SURVEY

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Introduction Bone health is a key determinant of spine surgery outcomes, influencing complication rates and recovery. Despite its importance, pre-operative bone health evaluation is often overlooked, and public awareness remains inconsistent. This study aimed to assess public knowledge and practices related to bone health using data from a diverse survey population.

Methods A public cross-sectional survey gathered responses from 1,440 participants via a 10-question quiz on bone health. Results were assigned letter grades (A: 90-100%,B: 80-89%,C: 70-

79%,D: 60-69%,F: <60%). Responses were analyzed by age, gender, presence of spine conditions, and prior history of spine surgery. Key questions addressed pre-operative bone health evaluation, awareness of spinal conditions, and questions regarding desired bone health-related information. Descriptive statistics were used to summarize responses, and bivariate analyses were conducted using likelihood ratio chi-square test to assess for differences between variables; at $p<0.05$.

Results Overall, 56.6% of respondents achieved high quiz scores (A or B). Among younger respondents (21-34 years), 49.3% scored A or B, compared to 70.0% of older respondents (65+ years). Over 90% across all age groups correctly recognized that bones weaken with age, while awareness of osteoporosis medications and their safety increased with age. Female respondents outperformed males, with 61.8% achieving grades A or B compared to 48.7% of males. Statistically significant gender differences were observed in identifying broccoli as beneficial and caffeine as harmful for bone health.

Among respondents diagnosed with a spine condition, 55.2% achieved grades A or B, and 52.4% reported having had a bone density test, compared to 31.7% of those without a spine condition. Interest in learning about bone health treatments was significantly higher among respondents with spine conditions (78.1%) than those without.

In respondents with a history of spine surgery, only 15.9% reported prior bone health evaluation, while 84.0% expressed interest in learning about treatment options. Most respondents (70.6%) indicated interest in improving or restoring bone health as well as interest in "why bone health matters to everyone" at 70%.

Conclusion This survey highlights significant gaps in public bone health evaluation and awareness, especially in spine surgery contexts. Increased educational initiatives and standardized screening protocols are necessary to improve outcomes and promote spinal health.

P1301

NEW PATIENT AND HEALTH CARE PROFESSIONAL TOOLS TO CONNECT SPINE AND BONE HEALTH

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The National Spine Health Foundation (NSHF) is the pre-eminent patient and health care professional advocacy organization in spinal health care. It is the only non-profit organization dedicated to helping patients overcome debilitating spinal conditions and take back their lives through patient education, award-winning research, and patient advocacy. NSHF gives patients the tools they need to make informed decisions about their spine health and navigate their own treatment journeys with confidence.

NSHF serves a critical gap in spinal health by representing the voice for patients, in connection with premiere professional societies through the Coalition for Spine Health, and fueled in partnership with industry leaders through our Spine Health Leadership Council. Our stated mission is to improve spinal health through patient education, patient advocacy, and clinical outcomes research.

We achieve much of our mission through our digital outreach efforts including our award winning website, www.spinehealth.org. We steward a vibrant community through our Spinal Champion program where patients share their successful spine health journeys to give hope and help to others seeking real answers. These Spinal Champion stories are featured on our Get Back To It podcast. Our prestigious Medical & Scientific Board volunteer their expertise to contribute to our content primarily through our premiere video education offering, SpineTalks, and through our bi-annual Spine Health Journal.

NSHF has seized this opportunity to educate spine patients as well as help spine surgeons and professionals increase patient outcomes through providing tools and resources on the importance of bone health optimization in surgical patients through the following new platforms:

1. Bone Hub (https://www.spinehealth.org/bonehub**):** An educational site for both patients and professionals on the connection between spine and bone health/osteoporosis (that has channels for patients, women age 50 and above, and health care professionals)

2. Health Care Professional Continuing Education Portal (https://cme.spinehealth.org**):** A health care professional site which hosts an on-demand webinar series, other on-demand continuing education videos, and the NSHF Spine & Bone Health ECHO® (Extension for Community Healthcare Outcomes) program. Project ECHO is a platform based out of the University of New Mexico that provides lifelong learning and guided practice that creates a learning environment for medical education and sharing of challenging clinical cases. ECHO's " hub-and-spoke" model is led by expert teams who use multipoint video-conferencing to conduct virtual clinics/sessions.

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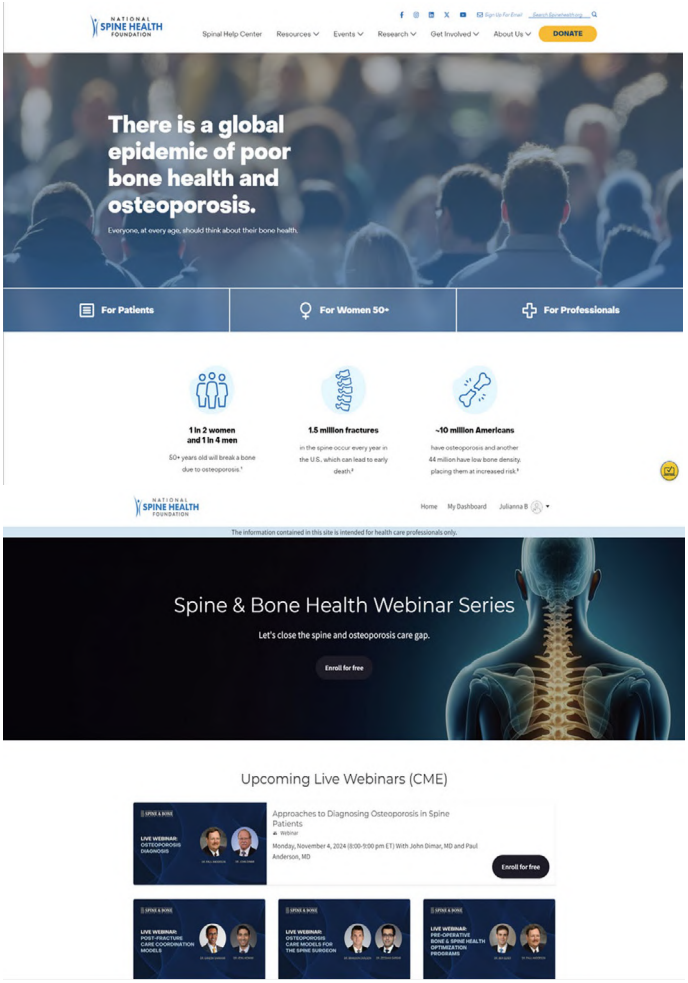

P1302

FREQUENCY OF VERY-HIGH RISK OSTEOPOROSIS ACCORDING TO THE CURRENT GERMAN GUIDELINE IN A WELL-CHARACTERIZED COHORT OF COMMUNITY-DWELLING GERIATRIC PATIENTS

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Objective: Bone anabolic treatment has been shown to be superior to oral bisphosphonates, especially in osteoporosis patients with a very high fracture-risk. The current German osteoporosis guideline classifies the very high 3-year fracture-risk based upon a novel fracture-risk model. As age is a severe risk-factor, we examined the distribution and associations to geriatric assessment parameters of the very high-risk group in a well-characterized cohort of community-dwelling geriatric patients.
Methods: Analyses were based on 166 patients (mean age 82±6 years) taken from MUSAR (MUnich SArcopenia Registry). Risk for hip or vertebral fracture within the next three years was calculated as described in the current German guideline. Thereupon, patients were allocated to the low-/moderate (<5%), high- (5-10%) or very high-risk (>10%) group. Associations of geriatric assessment parameters with the group allocation to the fracture-risk group were evaluated by covariate-adjusted linear regression analysis.
Results: More than 80% of the study population were at an increased fracture-risk. Besides, more than 50% were allocated to the very high-risk group. Patients in the very high-risk group showed limitations in all physical performance tests (short physical performance battery (SPPB), gaitspeed, handgrip strength and chair rise test). Also, polypharmacy and a risk for malnutrition (from mini nutritional assessment short form (MNA-SF)), were present. All parameters showed significant associations with group allocation to very high-risk group.
Conclusion: Most of the geriatric patients are at a very high-risk for osteoporotic fractures. Also, this group presented several limitations in the comprehensive geriatric assessment highlighting the vulnerability of this group. Clinicians need to reinforce fracture-risk assessment and familiarize with treatment options.

P1303

ESCAPE OF SERUM BETA CROSS LAPS (CTX) AT 6 MONTHS IN PATIENTS OF OSTEOPOROSIS TREATED WITH DENOSUMAB

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Abstract
Denosumab, a monoclonal antibody targeting RANKL, is commonly used to manage osteoporosis. This analysis aims to examine the characteristics and outcomes of patients receiving denosumab, with a particular focus on those who developed a rise in serum CTx at 6 months.

Methods:
We retrospectively reviewed data of of 200 consecutive patients treated with Denosumab for osteoporosis, between December 2023 and January 2025. Serum beta cross laps (CTx) were measured at 0, 3 and 6 months.by ELISA. Out of these, 18 patients (9%) showed substantial rise in CTx at 6 months - before the next dose was due. Bone Mineral Density (BMD) for these patients was measured at baseline and after 1 year of denosumab treatment.
Results:
Of the 200 patients (173 females, 27 males), 11 (5.5%) patients were < 60 years age. The mean age was 71.81 yrs. Diabetes was present in 107 patients. A total of 92 patients had at least one fracture, and 102 patients received denosumab as first-line treatment.
Among the 18 patients who showed CTx escape at 6 months, 1 was male, 17 females; 2 patients < 60 yrs, 1 had PHPT and 7 had DM.
In the escape group, the mean CTx at baseline was 520.38 pg/ml, at 3 months 104.57 pg/ml and at 6 months it was 447.94 pg/ml. From a low at 3 months, 6 (33%) patients had a 100% rise, 9 (50%) patients 50-100% rise, 2 (11.11%) patients had < 50% rise. All had CTx > 280 pg/ml at 6 months.
The subgroup's characteristics were further analyzed to identify any significant differences in clinical variables, including age, dia-

betes status, and prior treatment history.
Conclusion:
Denosumab remains a key therapeutic option for patients with osteoporosis, but some patients may experience CTx escape at 6 months.
Implications of this rise in CTx on long term management with denosumab remains unclear.

P1304

RELATIONSHIP BETWEEN VIGOROUS ACTIVITY AND MSK SYMPTOMS DURING A USER TRIAL OF THE INTELLIGENT KNEE OSTEOARTHRITIS LIFESTYLE APP

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Objectives: The purpose of this study was to assess the relationship between the quantity of weekly vigorous physical activity undertaken with the change in musculoskeletal (MSK) health symptoms during a short-term user trial of the intelligent knee osteoarthritis lifestyle app (iKOALA) in individuals with knee osteoarthrosis (KOA).
Materials and Methods: 19 (15 female, 4 male) participants with a mean age of 59 years (range 47-74 years) diagnosed radiographically or clinically with KOA completed a 12-week user trial of the iKOALA app. Participants downloaded the application onto their personal mobile phones and wore a physical activity monitor (Fitbit Inspire 2, Fitbit, USA) for the duration of the trial. Participants completed an in-app physical activity questionnaire which intelligently recommended suitable activities to individuals. Participants then self-selected several activities from the iKOALA library of exercises to create a personalised PA plan and followed this throughout the trial. Participants completed a MSK outcome measure questionnaire (MSK-HQ) for chronic symptoms at the start of the first week and at the end of the final week of the trial.
Results: Over the course of the trial, average MSK-HQ scores improved from 34.2 (week-0) to 40.8 (week-12) (6.6-point change) which was a statistically significant change (t (18) = -5.23; p < .001). In the final week of the user trial (week 12), participants completed an average of 10,441 steps and performed 30.6 minutes of vigorous activity on average. A Pearson correlation revealed a strong positive corelation coefficient between the amount of vigorous physical activity (in minutes) participants performed at week 12 and the change (week 1-12) in MSK-HQ health symptoms (r = 0.706, p = < .001).
Conclusions: The quantity of vigorous weekly physical activity performed as part of a physical activity plan may be an important factor in improving MSK symptoms in individuals with KOA.

P1305

ASSOCIATION OF TRABECULAR BONE SCORE AND OSTEOSARCOPENIA IN POSTMENOPAUSAL WOMEN WITH RHEUMATOID ARTHRITIS

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Osteosarcopenia, the coexistence of osteoporosis and sarcopenia, is a geriatric syndrome associated with an increased risk of falls and fractures. This study aimed to evaluate the prevalence of osteosarcopenia and its association with trabecular bone score (TBS) in postmenopausal osteoporotic women with rheumatoid arthritis (RA) compared to a matched control group.

The study included 15 postmenopausal women with RA and osteoporosis (RA group) and 15 postmenopausal women with osteoporosis without RA (control group). Demographic data, lumbar and femoral bone mineral density (BMD), and TBS were assessed. Sarcopenia was diagnosed using the algorithm developed by the Special Interest Group on Sarcopenia (1), incorporating the chair stand test (CST) and hand grip strength (HGS) to evaluate muscle function. Muscle mass was measured using the STAR (Sonographic Thigh Adjustment Ratio) score.

The mean age and BMI were comparable between groups (RA: 65.6 ± 9.4 years,BMI 27.2 ± 4.66; control: 65.5 ± 9.6 years, BMI 27.2 ±3.74). Osteosarcopenia was more frequent in the RA group (47%) compared to controls (20%). The RA group had significantly lower HGS (17.5 kg vs. 21.6 kg, p < 0.05) and STAR values (0.96 vs. 1.11, p < 0.05), but comparable BMD, TBS, and CST results. TBS was not significantly associated with sarcopenia in either group.

Osteosarcopenia is more frequent in postmenopausal women with RA compared to matched controls. RA patients should be routinely evaluated for sarcopenia. Early detection and management of sarcopenia in this population can reduce falls, improve quality of life, and prevent fractures.
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P1306

IMPROVEMENTS IN BONE DISORGANIZATION AND PROMOTION OF PSEUDOFRACTURE HEALING WITH ASFOTASE ALFA MAY BE DETECTABLE BY THE ALIGNOGRAM BEFORE CHANGES IN BONE RADIOGRAPHY OR SCINTIGRAPHY- A CASE REPORT

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Objective- *To assess if automated measurement of the magnitude of disarrangement of bone components (disorganization) from readily available standard x-rays allows quantitative assessment of improvements in bone abnormalities (including pseudofractures) during treatment of patients with hypophosphatasia (HPP)*

Hypophosphatasia being a serious genetic disease, it is reasonable to assume that in these settings of a genetic abnormality, impairment in bone cell functions will result in the formation or deposition of wrong bone components leading to a misarranged bone matrix. This produces bone abnormalities including fractures and pseudofractures. Indeed, as we have reported, when matrix elements are improperly stacked up (disorganized), the misfit between components leads to ineffective transfer of loads and energy causing damage, abnormalities and fractures (independently of other properties including BMD) [**1,2**]. An effective therapy by correcting the mineralization defect, should in turn improve bone organization (arrangement) and enhance fracture healing. Hence, *we hypothesized that measurement of the extent of bone disorganization allows (i.) quantification of the severity of bone abnormalities (ii.) and their improvement including healing of pseudofractures during therapy.*

Material and Methods: We analysed serial femoral X-rays and bone scintigraphy images collected at baseline, 3, 6, 12, 24 and 48 months in an 18-year-old female with benign prenatal HPP as reported by Kato et al [**3**]. Automated disorganization analysis was performed using an accurate and reproducible AI-based software (ALIGNOGRAM$_{1.0}$) as previously reported. Pseudofracture was detectable as the location with maximum disarrangement (misalignment) [**2**]. For a detailed analysis, each bone was subdivided into 9 consecutive locations.

Results: As shown in Figure 1, the therapeutic response marked by the improvement in arrangement (organization) of bone components and pseudofracture healing was detectable within 3 months of asfotase alfa initiation, and this was before any improvement was visible on *either X-Rays* or bone scintigraphy.

Conclusion: Bone disorganization (disarrangement) is a novel pathogenic mechanism and biomarker of diseases [**1,2**]. In this first-ever study, we report that quantification of this novel biomarker (Disorganization) from standard readily available standard X-rays using tools such as the ALIGNOGRAM Software may open new and affordable pathways for a quantitative assessment of disease progression and response to therapy in patients with HPP.

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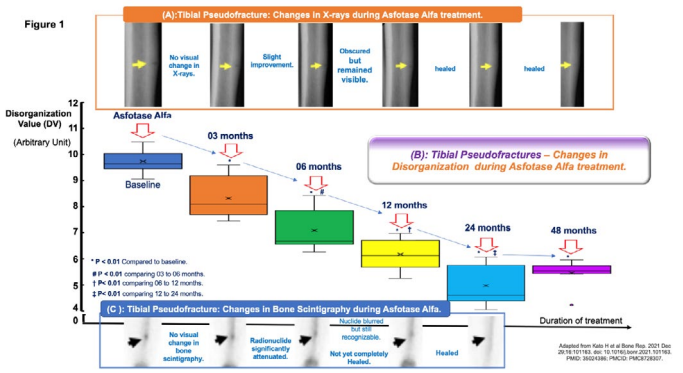
Figure 1



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Disclosures: Dr Zebaze Roger is the inventor of the ALIGNOGRAM software

P1307

QUANTITATIVE MEASUREMENT OF THE DISORGANIZATION PATTERN FROM STANDARD X-RAYS- A NOVEL APPROACH TO THE ASSESSMENT OF THE SEVERITY OF HYPOPHOSPHATASIA AND RESPONSE TO THERAPY IN CHILDREN – A CASE REPORT

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Objective Determine if changes in bone abnormalities in children with hypophosphatasia (HPP) during treatment can be assessed by automatically quantifying the magnitude of disarrangement of bone components (disorganization) from readily available standard plain x-rays.

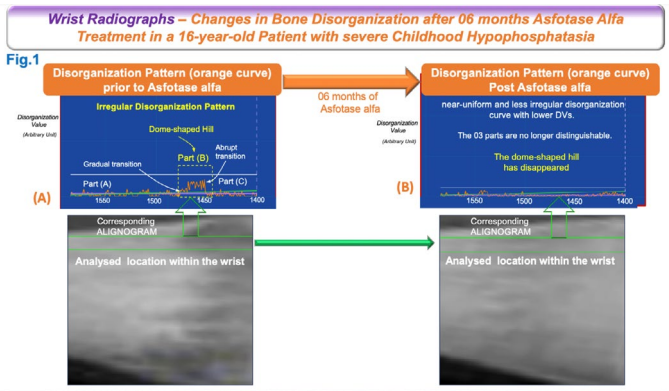
Quantitative assessment of radiographic features of HPP in children that moreover, does not require radiologic expertise remains an unmet.

As HPP is a genetic disease, it is reasonable to assume that the subsequent impairment in bone cell function will result in the formation or deposition of incorrect bone components leading to a misarranged (disorganized) bone matrix. As we have published, when matrix elements are improperly stacked up (disorganized), the misfit between components leads to ineffective transfer of load and energy causing damage, abnormalities and fractures (independently of other properties including BMD) [**1,2**]. Effective treatments will result in the formation and deposition of right bone components thereby improving or correcting the misarrangement of bone matrix. Hence, *we hypothesized that measurement of the extent of bone disorganization allows quantitative assessment of improvement of bone abnormalities in children with HPP during treatment*.

Material and Methods: We analysed serial distal radius collected at baseline and after 6 months in a 16-year-old male with HPP [**3**]. Automated disorganization analysis was performed using an accurate and reproducible AI-based tool (ALIGNOGRAM1.0) as previously reported [**2**]. For a detailed analysis, each bone was subdivided into 187 consecutive locations.

Results: As shown in **Figure 1**, there was a distinct disorganization pattern observed across all 187 locations before asfotase alfa therapy— a dome-shaped portion in the curve signalling the presence of a lucency. After 6 months of treatment, there was a near or complete disappearance of this dome-shaped in all locations signalling an improved arrangement of bone matrix in the entire bone. Moreover, the severity of baseline disorganization correlated with the magnitude of improvement with therapy (R2=0.62; p<0.0001).

Conclusion: This first-ever study highlights that disorganization analysis is a potentially reliable and sensitive radiological parameter in assessing paediatric HPP. This novel biomarker (disorganization, disarrangement assessment) may open new and affordable pathways for a quantitative assessment of disease progression and response to therapy in these patients.



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Disclosures: Dr Zebaze Roger is the inventor of the ALIGNOGRAM software

P1308

THE IMPACT OF DYNAMIC BALANCE PLATFORM TRAINING WITH BIOFEEDBACK ON STRENGTH PERFORMANCE FOLLOWING ACL RECONSTRUCTION

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Objective: To assess the effectiveness of training exercises on an balance platform with biofeedback as part of a comprehensive rehabilitation program following anterior cruciate ligament (ACL) reconstruction.

Methods: Thirty-one patients (19 males, 12 females, age 28.6 ± 6.2 years), 6-12 weeks post-unilateral ACL reconstruction, participated in the study. All participants underwent a rehabilitation program that included group gymnastics, gym machines, stationary cycling, massage, magnetic field exposure, neuromuscular

electrical stimulation, and laser therapy. Patients were randomly assigned to the main group (n = 16, 9 males, 7 females, age 29.7 ± 3.6 years) or the comparison group (n = 15, 10 males, 5 females, age 27.3 ± 5.2 years). The main group underwent balance training on a dynamic platform, while the comparison group followed only the standard rehabilitation program. Testing was conducted before and after a 2-week training program, which included isometric single-leg flexion and extension strength tests using an isokinetic dynamometer for both legs.
Results: At the beginning of the rehabilitation program, the strength of the operated leg was reduced by 51.4% compared to the contralateral leg ($p<0.05$) in the main group. After rehabilitation, the muscle strength deficit was reduced to 31.6% ($p<0.05$). In the control group, the deficits were 52.5% and 41.3% ($p<0.05$), respectively. At the end of the two-week rehabilitation course, the mean torque gain (Nm) was 7.9% (1.7 Nm) higher in the main group. Maximal torque was 54.7% higher for extension (8.1 Nm) and 18% higher for flexion (4 Nm) compared to the control group.
Conclusion: A two-week course of rehabilitation, involving training on an unstable platform, significantly reduces the strength imbalance between the operated and contralateral legs 6-10 weeks after ACL reconstruction.

Table 1. Post-rehabilitation changes in biomechanical indices

Isokinetic parameter	Main group	Control group
Peak extension torque (Nm)	56,9 ^ (25%-52,7; 75%-125,2)	44,8 (25%-34,8; 75%-55,1)
Peak flexion torque (Nm)	60,8 ^ (25%-49,9; 75%-82,4)	39,2 (25%-28,7; 75%-59,4)
Mean peak extension torque (Nm)	51,9 ^ (25%-34,4; 75%-96,7)	29,4 (25%-14,9; 75%-41,4)
Mean peak flexion torque (Nm)	51,5 ^ (25%-42; 75%-74,6)	27,6 (25%-15,2; 75%-44,5)
Mean extension torque (Nm)	24,9 ^ (25%-15; 75%-33,2)	12,7 (25%-7,3; 75%-23,1)
Mean flexion torque (Nm)	30,2 ^ (25%-25,5; 75%-44,9)	22,4 (25%-13,8; 75%-31,5)
Mean extension power (Watt)	11 ^ (25%-6,9; 75%-21,9)	4,9 (25%-2,7; 75%-11,2)
Mean flexion power (Watt)	10,2 ^ (25%-8; 75%-16,9)	6 (25%-4,1; 75%-10,8)
Total extension work (J)	562,2 ^ (25%-365,6; 75%-1028,6)	271,4 (25%-196,7; 75%-482,1)
Total flexion work (J)	544,8 ^ (25%-464,6; 75%-883,7)	375,6 (25%-302,4; 75%-627,2)

P1309

LOW-LEVEL LASER THERAPY PROTECTS CARTILAGE IN RABBIT EXPERIMENTAL KNEE OSTEOARTHRITIS

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Previous studies have shown a beneficial effects of low-level laser therapy (LLLT) in experimental osteoarthritis (OA).
Objective. The purpose of our study was to test LLLT effects on knee articular cartilage of rabbits with knee experimental osteoarthritis (KOA).
Material and Methods. Experimental OA was induced in 18 mature female rabbits by anterior cruciate ligament transection (ACLT). Ten weeks after ACLT, rabbits were randomized in a 3 groups: two control group and one treated groups. The treated group were exposed to LLLT for 10 days. First control group (C1) was sacrificed immediately after the end of the period utilized for OA inducing. The second control group (C2) was exposed to sham LLLT and was sacrificed together with the treated groups, after the treatment ending. The cartilage samples were obtained from OA joints of the sacrificed rabbits and were evaluated by optical microscopy and transmission electron microscopy (TEM).
Results.
LLLT improved chondrocytes division and maintained ECM structure and integrity.
Conclusions. LLLT was efficient in alleviating cartilage damages and can be considered a disease modifying therapy for OA patients.

P1310

EXPLORING ULTRASOUND AND SHEAR WAVE ELASTOGRAPHY FOR DETECTION OF MUSCLE CHANGES IN PRESARCOPENIA: INSIGHTS FROM THE FLEXOR DIGITORUM PROFUNDUS MUSCLE EVALUATION

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Objective:
Low muscle mass is a key criterion for diagnosing presarcopenia. While computed tomography (CT) and magnetic resonance imaging (MRI) are considered gold standards for muscle assessment, dual-energy X-ray absorptiometry (DXA) is commonly used as clinical alternative. Recently, ultrasound (US) and shear wave elastography (SWE) have been increasingly utilized to evaluate muscle quantity and quality. Although significant results have been achieved for the lower extremities, the role of upper extremity muscle assessment remains less well established. Thus, this study aimed to evaluate the flexor digitorum profundus (FDP) muscle, a critical component of handgrip strength, using US and SWE in patients with low and normal muscle mass.

Materials and Methods:
The study included 50 age- and gender-matched participants, aged over 60 years, divided into two groups based on appendicular skeletal muscle mass (ASM) measured by DXA: low muscle mass (presarcopenia) and normal muscle mass. Clinical evaluation included handgrip strength (HGS) and forearm circumference (FC). Muscle assessment involved US-derived parameters such as echogenicity and cross-sectional area (CSA), as well as SWE measurements in both relaxed and contracted state using a hand dynamometer.
Results:
Findings indicated that HGS was preserved in the presarcopenic group ($p = 0.244$). However, the CSA of the FDP, an ultrasound marker of muscle quantity, was significantly reduced in the low muscle mass group ($p = 0.02$). SWE demonstrated excellent intrarater reliability, with an intraclass correlation coefficient (ICC) of 0.854 in the relaxed state and 0.857 in the contracted state. However, SWE measurements did not show statistically significant differences between groups. In contrast, muscle echogenicity, assessed using a visual semi-quantitative scale, effectively differentiated between groups, indicating reduced muscle quality in presarcopenia ($p<0.001$).
Conclusions:
US demonstrated superior performance compared to SWE in detecting muscle quality changes in the upper extremity, specifically the FDP muscle, at the presarcopenic stage. While muscle strength remains preserved, reduced muscle quantity is reflected by a smaller CSA on ultrasound and decreased FC clinically. These findings highlight the utility of US as a diagnostic tool for early muscle alterations in presarcopenia.
Conflict of Interest Statement: The authors declare no conflicts of interest related to this study.

P1311

OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURE DIAGNOSED BY BONE SCINTIGRAPHY: A CASE REPORT

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Background: Vertebral fractures are the most common osteoporotic fractures, and also most difficult and very frequent complications of osteoporosis. Bone scintigraphy is a sensitive method for investigating skeletal pathology. Typical scintigraphic findings for vertebral fracture is markedly increased radiotracer uptake in the linear pattern, throughout collapsed vertebral body. Bone scintigraphy with 99mTc-phosphonates enables early detection of vertebral compression fractures in patients with osteoporosis
Objective. To highlight the importance of bone scintigraphy in diagnosis of osteoporotic vertebral fractures and in diagnosis and management of osteoporosis.
Case study. Report of a patient with prostate cancer referred to routine bone scintigraphy as a part of follow up of therapy. Bone scintigraphy showed increased linear uptake in the second lumbar vertebra. Follow-up X-ray revealed a compression fracture at L2 with loss of vertebral height. Follow up densitometry was consistent with severe osteoporosis and patient was treated with intravenous bisphosphonates.
Conclusions: Bone scintigraphy can have a role in early diagnosis of vertebral fractures because of typical scintigraphic patterns for the latter. Earlier identification and treatment of vertebral compression fractures may reduce pain and associated sequelae in patients with osteoporosis.

P1312

PREVALENCE OF FALLS AND ASSOCIATED RISK FACTORS AMONG POSTMENOPAUSAL WOMEN IN IRAN: FINDING FROM NATIONWIDE STEPS SURVEY 2021

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Objective: The aim of this study is to assess the prevalence of falls and associated risk factors among postmenopausal women in Iran.
Method: A total of 4855 postmenopausal women from the nationwide STEPS survey 2021 in Iran were included in this study. Menopausal status information was self-reported, and associated risk factors, including age, smoking status, years of schooling, BMI, multimorbidity, physical activity, wealth index, and alcohol consumption, were analyzed. A stepwise logistic regression model was employed, with a significance level of 0.2 for variable entry, to identify factors associated with the odds of falling. Odds ratios (ORs) and 95% confidence intervals (95% CIs) were calculated for menopausal status. The data were weighted and the weighting process was done based on the age, sex and area stratifications in province level of 2016 Iranian census.
Results: The prevalence of falling among postmenopausal women was 4.22% (95% CI: 3.62–4.91). In the primary model examining factors associated with the odds of falling, three variables—age, marital status, and comorbidity—were identified as significant. Women aged over 60 years had 72% higher odds of falling (OR: 1.72, 95% CI: 1.22–2.43) compared to those under 60 years. Married women had 76% lower odds of falling (OR: 0.24, 95% CI: 0.10–0.58) compared to single participants. Having one comorbid condition was associated with a 58% increase in the odds of falling (OR: 1.58, 95% CI: 1.09–2.29), while having two or more comorbidities further increased the odds of falling by 66% (OR: 1.66, 95% CI: 1.10–2.51).
Conclusion: This study highlights a notable prevalence of falls among postmenopausal women, with age, marital status, and comorbidities identified as significant risk factors. Targeted interventions addressing older age and managing comorbid conditions could help reduce the risk of falls in this population.

P1313

SMOKING STATUS AND FALL RISK IN IRANIAN MEN: INSIGHTS FROM A NATIONAL CROSS-SECTIONAL STUDY

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Objective:
This study aimed to determine the prevalence of falls among men based on smoking status, including never smokers, ex-smokers, current smokers, and passive smokers and to assess the relationship between smoking status and fall risk.
Method:
Data for this cross-sectional analysis were sourced from nationwide STEPS survey 2021 in Iran. Fall were assessed by using a question about fall events in the past year. Smoking status was categorized as never smokers (reference group), ex-smokers, current smokers, and passive smokers (exposed to secondhand smoke). A stepwise logistic regression model with a significance level of 0.2 for exit was used to identify variables associated with the odds of falling. Odds ratios (ORs) and 95% confidence intervals (95% CIs) were calculated for each smoking category, adjusted for key demographic and health variables such as age, BMI, employment status, wealth index, years of schooling, multimorbidity, and marital status.
Results:
Overall, 12,479 men with a mean age of 46.20 years (95% CI: 45.88–46.52) were included in the analysis. The total prevalence of falls in this population was 2.4% (95% CI: 2.11–2.73). Among men with a history of falls, 36.69% (95% CI: 30.43–43.44) were never smokers (reference group). Ex-smokers comprised 5.31% (95% CI: 3.05–9.10), with an odds ratio (OR) of 1.33 (95% CI: 0.69–2.55) compared to never smokers; however, this association was not statistically significant (p = 0.395). In contrast, 33.84% of individuals with a history of falls were current smokers (95% CI: 28.00–40.22), with an OR of 1.72 (95% CI: 1.23–2.40), indicating a statistically significant association (p = 0.002). Additionally, 24.16% of this population were exposed to secondhand smoke (95% CI: 19.20–29.92), with an OR of 1.37 (95% CI: 0.97–1.94). Although this association showed a trend towards significance, it did not reach statistical significance (p = 0.071).
Conclusion:
The findings indicate that current smoking is significantly associated with an increased risk of falls among men, while exposure to secondhand smoke shows a borderline association. No significant relationship was observed between ex-smoking and falls. These results highlight the potential role of smoking cessation and reducing secondhand smoke exposure in fall prevention strategies.
Keywords: Smoking, Falls, Prevalence, Iran

P1314

PREVALENCE OF FALLS AMONG POSTMENOPAUSAL WOMEN AND ITS ASSOCIATED RISK FACTORS IN IRAN: RESULTS OF NATIONWIDE STEPS SURVEY 2021

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Objective: The aim of this study is to assess the prevalence of falls and associated risk factors among postmenopausal women in Iran.
Method: A total of 4855 postmenopausal women from the nationwide STEPS survey 2021 in Iran were included in this study. Menopausal status information was self-reported, and associated risk factors, including age, smoking status, years of schooling, BMI, multimorbidity, physical activity, wealth index, and alcohol consumption, were analyzed. A stepwise logistic regression model was employed, with a significance level of 0.2 for variable entry, to identify factors associated with the odds of falling. Odds ratios (ORs) and 95% confidence intervals (95% CIs) were calculated for menopausal status. The data were weighted and the weighting process was done based on the age, sex and area stratifications in province level of 2016 Iranian census.
Results: The prevalence of falling among postmenopausal women was 4.22% (95% CI: 3.62–4.91). In the primary model examining factors associated with the odds of falling, three variables—age, marital status, and comorbidity—were identified as significant. Women aged over 60 years had 72% higher odds of falling (OR: 1.72, 95% CI: 1.22–2.43) compared to those under 60 years. Married women had 76% lower odds of falling (OR: 0.24, 95% CI: 0.10–0.58) compared to single participants. Having one comorbid condition was associated with a 58% increase in the odds of falling (OR: 1.58, 95% CI: 1.09–2.29), while having two or more comorbidities further increased the odds of falling by 66% (OR: 1.66, 95% CI: 1.10–2.51).
Conclusion: This study highlights a notable prevalence of falls among postmenopausal women, with age, marital status, and comorbidities identified as significant risk factors. Targeted interventions addressing older age and managing comorbid conditions could help reduce the risk of falls in this population.
Keyword: Menopause, Fall, Iran

P1315

THE IMPACT OF OBESITY AND DIABETES ON INCIDENT FRACTURE OVER 15 YEARS OF FOLLOW-UP: TEHRAN LIPID AND GLUCOSE STUDY

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Objective: We investigated the association between general obesity/ central adiposity and diabetes with fractures, both independently and concurrently, to address the controversy in their associations.
Materials and Methods: This study was conducted on 7,562 participants aged ≥30 years. T2DM was defined as fasting plasma glucose ≥7 mmol/L, 2-hour post-challenge glucose ≥11.1 mmol/L, or diabetes medication use. General obesity was defined as BMI ≥30 kg/m², and central adiposity as waist circumference ≥95 cm for Iranian adults. Age-standardized fracture incidence rates were calculated per 100,000 person-years using Segi's world standard population. Moreover, multivariable stratified Cox regression analysis was used to estimate hazard ratios (HRs (95% CI)) for any fracture incidence.
Results: Over a 15-year follow-up period, around 4% of adults had at least one fracture. The age-standardized incidence rates are presented in **Table 1**. We found that both central and general obesity increased the risk of fractures compared with non-obese adults, regardless of T2DM status with a more prominent association for central obesity. Diabetes without obesity did not show any association with any fracture. (Table 1)
Conclusion: The analysis showed that both central and general obesity, but not diabetes alone, increases the risk of fracture, especially central adiposity.

Table1: Incidence rate and risk of any fracture according to different combinations of obesity and type 2 diabetes

	E/N	ASR (95% CI)	HR(95% CI)	p-value
General obesity				
Non-Obese without T2DM	217/5211	343.4(297.3-394.3)	Reference	
Non-Obese with T2DM	14/367	207.7(113.4-369.6)	0.61(0.27-1.37)	0.231
Obese without T2DM	58/1737	260.0(194.4-340.1)	**1.29(1.02-1.65)**	**0.036**
Obese with T2DM	15/247	459.1(235.9-804.3)	1.35(0.86-2.11)	0.185
Central adiposity				
Non-Obese without T2DM	159/4563	302.5(253.6-357.6)	Reference	
Non-Obese with T2DM	6/234	174.1(63.7-391.8)	0.78(0.34-1.78)	0.556
Obese without T2DM	116/2385	358.4(295.6-430.6)	**1.64(1.17-2.29)**	**0.004**
Obese with T2DM	23/380	416.6(237.2-682.6)	**1.83(1.09-3.07)**	**0.022**

Model included: obesity phenotype, age, sex, systolic blood pressure, triglycerides, non-high-density lipoprotein cholesterol, estimated glomerular filtration rate, current smoking, education levels, family history of diabetes, use of steroid medications, hypertension medications, lipid-lowering medications, body mass index (for central adiposity)/ waist circumference (for general obesity) as appropriate
E: events; N total number; ASR: age-standardized incidence rate; T2DM: type 2 diabetes; HR: hazard ratio; CI: confidence interval.

P1316

THE ASSOCIATION OF GENERAL/CENTRAL OBESITY WITH THE INCIDENCE OF FRACTURE IN THE PRESENCE OR ABSENCE OF METABOLIC DISORDERS: 15-YEAR FOLLOW-UP IN THE TEHRAN LIPID AND GLUCOSE STUDY

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Objective: To examine the association of different obesity phenotypes with all fractures in a longitudinal population study.
Materials and Methods: We involved 7,562 participants aged >=30 years, followed for 15 years. Participants were categorized based on their obesity status and the presence of metabolic syndrome (MetS). General obesity was defined as a BMI of ≥30 kg/m², and central adiposity was defined as a waist circumference of ≥95 cm for Iranian adults. MetS was defined according to the Joint Interim Statement criteria. Cox regression analysis was employed to estimate hazard ratios (HRs, 95%CIs), adjusted for age, sex, marital status, smoking, education, physical activity, and the use of steroid medications.
Results: The non-obese without MetS group served as the reference, with an age-standardized incidence rate of 346 (95%CI:291-408) per 100,000 person-years. Non-obese individuals with MetS did not exhibit a significant increase in fracture risk (adjusted HR=0.98, 0.73-1.32). General obesity without MetS was associated with a significantly lower fracture risk (HR=0.64, 0.41-0.99),

which changed negligibly after adjustment. In contrast, abdominal obesity without MetS indicated an increased fracture risk (adjusted HR=1.40, 1.07-1.83). Both types of obesity with MetS did not show any significant increase in fracture risk (Table 1).

Conclusion: These findings highlight the complex relationship between obesity phenotypes and fracture risk. While general obesity may confer some protective benefits, central obesity is associated with an increased risk of fractures. Additionally, the presence of MetS alters this dynamic significantly, although it does not inherently increase the risk of fractures itself.

Table 1: Hazard Ratio (95% CI) of any fracture for different combinations of obesity and metabolic syndrome among a Tehranian population

	E/N	Model 1	Model 2
Obesity phenotypes by BMI			
Non-Obese without MetS	166/4253	Reference	Reference
Non-Obese with MetS	65/1325	0.95(0.71-1.28)	0.98(0.73-1.32)
Obese without MetS	23/945	**0.64(0.41-0.99)**	**0.65(0.42-1.02)**
Obese with MetS	50/1039	1.04(0.75-1.44)	1.07(0.78-1.49)
Obesity phenotypes by waist circumference			
Non-Obese without MetS	143/4206	Reference	Reference
Non-Obese with MetS	22/591	0.79(0.50-1.25)	0.83(0.53-1.32)
Obese without MetS	95/1938	**1.36(1.04-1.76)**	**1.40(1.07-1.83)**
Obese with MetS	44/827	1.17(0.82-1.65)	1.22(0.86-1.73)

Model 1: obesity phenotype, age, sex;
Model 2: model 1 and marital status, current smoking, education levels, physical activity, use of steroid medications

P1317

INSIGHTS FROM THE STRONG SURVEY: MAPPING CALCIUM SUPPLEMENTATION PATTERNS ACROSS 924 PHYSICIANS IN INDIA

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Introduction
Calcium deficiencies and related bone health issues, such as osteoporosis and fractures, are increasingly prevalent across age groups due to changing lifestyles and dietary habits.
Methods
The STRONG survey (Screening Treatment Recommendations Optimization Navigation Guidance) engaged 924 physicians in a nationwide, pan-India mapping exercise as cross-sectional study to comprehensively understand the importance of calcium therapy and calcium supplementation patterns. Conducted via a secure digital platform, the survey ensured data integrity and confidentiality. Statistical analysis, performed using GraphPad 10.4.1,
Results
The mean experience was 9.1 ± 10 years (95% CI 8.4 to 9.7). The cumulative man-years of experience were 8376 years. The findings highlight key patterns in calcium supplementation, with older adults (55+ years, 37.23%) and middle-aged adults (36-55 years, 33.55%) being the primary recipients due to their heightened risk of osteoporosis and fractures, while younger adults (18-35 years, 23.7%) and pediatric patients (5.52%) receive fewer prescriptions, reflecting dietary adequacy in these groups. Postmenopausal women (47.94%) and the elderly (23.7%) dominate clinical indications, emphasizing the focus on preventing osteoporosis and fractures, while adolescents (18.29%) and children (10.06%) are targeted for peak bone mass development and growth. Modern lifestyle changes have resulted in reduced calcium intake for 66.34% of patients, driven by lower dairy consumption and increased reliance on processed foods, although health awareness efforts have improved intake for 23.38%. Calcium gummies, considered beneficial by 75.43%, improve compliance but require careful guidance on dosage. In type 2 diabetes, 80.96% of respondents recognize the relevance of calcium supplementation in addressing bone health risks associated with metabolic changes.
Discussion
The findings highlight significant gaps in calcium supplementation across demographics, emphasizing the need for targeted strategies to address deficiencies. Older adults and postmenopausal women remain priority groups, while lifestyle changes underscore the importance of education on dietary calcium. Novel supplementation forms like gummies improve adherence and play a crucial role in promoting better bone health outcomes

P1318

ADULT AND GERIATRIC VACCINATIONS HELP SIGNIFICANTLY FOR NOT GETTING FRACTURED BY AVOIDING FALLS DUE TO INFECTIONS BY VACCINE PREVENTABLE DISEASES (VPD)

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This is retrospective study of last 28 yrs , between 1 Jan 1997 and 1 Jan 2025 . The presenting author is also PI at KBFII . Total 294 beneficiaries are for this study . Out of this 152 are females and 142 are males . During the course of follow up, those who died , even though they were vaccinated and not suffered any fractures are excluded . The age group included is between 40 yrs and 100 yrs . The age wise break up is as follows :
A)Between 40 and 49 years = T : 35 , F : 21 , M :14
B) Between 50 and 59 years = T : 68 , F : 36 , M : 32
C) Between 60 and 69 years = T : 79 , F : 43 , M : 36
D) Between 70 and 79 = T : 61 , F : 22 , M: 39
E) Between 80 and 89 years = T : 39 , F : 25 , M : 14
F) Between 90 and 100 years = T : 12 , F : 5 , M : 7
The WHO , CDC and AGS guidelines are followed to vaccinate the beneficiaries . The institute has data of last 38

years . Most vaccination were done by home visits . All beneficiaries were also given the advice about Anti-Osteoporosis Medications (AOM) , diet and exercises .

RESULTS : Vaccine Preventable Diseases (VPDs) like Pneumonia , Hepatitis (A&B) , Herpes Zoster etc are the major causes of infections , followed by hospital admissions . The complications include fatigue , inability to walk and stand . The most dreadful complications are falls , leading to fragility fractures . But the beneficiaries are immunised for VPDs , they got the immunity against these diseases . Amongst all 294 , no one have suffered any fracture.
CONCLUSIONS : Vaccinations form as an evidence based tool for preventing VPDs and its associated infections . One of the major complications of VPDs are falls due to infections and reasons of ED visits . Adult and geriatric vaccinations help significantly for not getting fractured by avoiding falls due the infections by VPDs.

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P1319

UNDERDIAGNOSIS AND MANAGEMENT OF OSTEOPENIA AND OSTEOPOROSIS IN YOUNGER WOMEN WITH BREAST CANCER UNDERGOING HORMONE THERAPY

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Introduction
Osteopenia and osteoporosis are often underdiagnosed in younger women on hormone therapy for breast cancer. These conditions frequently go unrecognized and untreated, despite increased bone loss risk from aromatase inhibitors and chemotherapy. Early detection and intervention are essential to prevent fractures and other complications. This study highlights the importance of regular bone density monitoring and proactive management in this vulnerable population. It aims to underscore the need for vigilance in their care.
Aim
The aim of this study is to evaluate whether patients aged 50 years or younger with breast cancer at Prokuplje Hospital are being diagnosed and treated for osteoporosis and fracture prevention.
Methods
A survey was conducted involving 118 breast cancer patients undergoing hormone therapy at the oncology department of Prokuplje Hospital. The survey included questions about previous or current bone fractures, possible osteoporosis diagnosis, recommended osteodensitometry, and osteoporosis treatment.
Results
The average age of the patients was 42.36 years, ranging from 32 to 50 years. The duration of hormone therapy spanned from 5 to 10 years, with an average duration of 8.45 years. Among the patients, 24 (20.3%) experienced hip fractures, while 16 (13.6%) had vertebral fractures. Osteodensitometry was recommended to 37 patients; however, 18 (48.6%) did not follow through with this recommendation. They were also advised to increase their calcium and vitamin D intake.
Out of the 19 patients who underwent osteodensitometry, 17 (89.5%) met the criteria for an osteoporosis diagnosis and 2 (10.5%) were diagnosed with osteopenia. Bisphosphonate therapy was recommended to all 19 patients, but only 11 (57.9%) accepted the recommendation. After one year of bisphosphonate therapy, patients underwent follow-up osteodensitometry, which showed statistically significant improvement in bone mineral density for all of them.
Conclusion
The results of this study indicate a need for additional efforts in diagnosing and treating osteoporosis among breast cancer patients aged 50 years or younger to prevent fractures, especially hip fractures. The findings suggest that more proactive measures should be taken to ensure that these patients receive the necessary osteoporosis care and fracture prevention strategies.

P1320

FORMATION OF EXTRACELLULAR TRAPS BY BLOOD NEUTROPHILS AND MONOCYTES IN OSTEOARTHRITIS

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Objective:
To compare extracellular traps (ET) formation by neutrophils and monocytes in osteoarthritis patients with and without exacerbation.
Methods:
Neutrophils and monocytes were purified with centrifugation procedure using originally designed iohexol density gradients [1, 2]. The cell types in resulting fractions were identified histochemically, and the extent of cell activation was assessed using common NBT test. ET generation was stimulated by phorbol-12-myristate-13-acetate. The shape and size of ET were assessed using fluorescence microscopy with SYBR green [3, 4]. Central tendencies are expressed as means (95% CI).
Results:
23 patients with verified OA (6 males and 17 females, mean age 5.4 years, mean disease duration 12.5 years). 30 healthy volun-

teers were enrolled as a reference group. OA patients were in clinical remission at the time of inclusion in the study. Synovitis was diagnosed in 18 OA patients during the study (3, 8 and 12 months after inclusion in the study). Mean fraction of spontaneous ET exhibition by neutrophils and monocytes was 5.3 (5.1-5.5)% and 7.9 (7.1-8.7)% for OA patients in remission, respectively. Mean fraction of induced ET exhibition by neutrophils and monocytes was 20.6 (18.4-22.8)% and 21.7 (19.2-24.2)% for OA patients in remission, respectively. Mean fraction of spontaneous ET exhibition by neutrophils and monocytes was 13.2 (12.8-13.6)% and 15.0 (14.5-15.5)% for synovitic OA patients, respectively. Mean fraction of induced ET exhibition by neutrophils and monocytes was 28.8 (26.6-31.0)% and 30.2 (28.1-32.3)% for synovitic OA patients, respectively. The growth rate of spontaneous and induced ET formation by neutrophils was 149.1% and 39.8%, respectively. The growth rate of spontaneous and induced ET formation by monocytes was 89.9% and 39.2% respectively.

Conclusion:

Distinct increase of in the intensity of spontaneous ET generation by both peripheral neutrophils and monocytes during OA exacerbation and the development of synovitis, suggesting that circulating monocytes may be primed to ETosis through immune inflammation.

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P1321

RHEUMATOID ARTHRITIS: ENZYMATIC PATTERN OF PRO- AND ANTIOXIDANT ENZYMES DEPENDING ON CLINICAL FEATURES

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Background. Rheumatoid arthritis (RA) is an autoimmune rheumatic disease of unknown etiology characterized by chronic erosive arthritis and systemic organ involvement resulting in early disability and shorter life expectancy.

Objective. To assess plasma activities of essential prooxidant and antioxidant enzymes in RA patients.

Methods. 71 RA patients (46 women and 25 men) were enrolled in the study. The diagnosis was verified using ACR/EULAR criteria (2010). RA activity was measured using DAS28. 30 healthy persons comprise control group. Plasma xanthine oxidase (XO; EC 1.17.3.2), xanthine dehydrogenase (XDH; EC 1.17.1.4), superoxide dismutase (SOD; EC 1.15.1.1) activities were measured spectrophotometrically [1, 2, 3]. Statistical analysis was performed using Statistica 6.0. Differences were considered significant when $p<0.05$. Reference ranges were calculated as means ±2SD.

Results. Mean age of patients was 43.2±3.6 years, mean RA duration was 11.9±2.6 years. 24 (33.8%) RA patients had low disease activity, 6 (8.5%) patients had high one. Extra-articular manifestations were found in 30 (42.2%) patients. Reference ranges for XO, XDG, SOD activities were 2.28-5.12 nmol/min/ml, 3,96-7,24 nmol/min/ml, and 3,13-6,58 units, respectively. RA patients had increased both mean XO and mean SOD activities ($p<0.001$). XO activity reached its highest values at maximum disease activity and overt extra-articular involvements, while SOD activity did it in moderate and high disease activities as well as in patients with joint manifestations. XDG activity was increased in low disease activity ($p<0.001$) and solely joint lesions ($p=0.011$), while moderate or high disease activities ($p=0.008$) and extra-articular involvements ($p=0.025$) were characterized by decreased activity of this enzyme.

Conclusion. Plasma enzymatic pattern in RA patients is characterized by activation of both oxidant and antioxidant metabolic pathways. Activities of XO and SOD were positively correlated with RA activity, while XDG activity was negative correlated with RA activity. The differences between selective articular RA type and RA form with extraarticular manifestations were also revealed.

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P1322

COMPARISON OF OSTEOARTHRITIS AND RHEUMATOID ARTHRITIS SYNOVIAL HISTOLOGIC FEATURES

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Objective.

to compare histological features of synovial tissue in RA and OA patients using previously published data.

Methods.

Methods: Databases of scientific publications (Scopus, Web of Science, PubMed, Russian Science Citation Index) were included in the search using appropriate search terms and period of publication 2000-2024.

Results.
A total of 125 articles were retained for analysis. Synovial membrane samples were preferentially obtained from grossly inflamed synovium. The following histologic features: synovial hyperplasia, lymphocytes, plasma cells, binucleated plasma cells, Russell bodies, synovial giant cells, sublimating giant cells, fibrin, fibrosis, mucin, debris, neutrophils, granulation tissue, mast cells, synovial chondrometaplasia, germinal centers, and vascularization were scored. Histologic features of synovium in RA compared with OA included: lining hyperplasia, lymphocytic inflammation, plasma cells, Russell bodies, binucleate plasma cells, synovial lining giant cells, binucleate plasma cells, sub-lining giant cells, neutrophils, fibrin and detritus. Fibrosis and mast cells are key histologic features in OA. However, lymphatic complexes, plasma cells, Russell bodies, binucleated plasma cells were observed in 27%, 15%, 9%, and 11%, respectively. No differences were found between patients with OA and RA regarding the frequency of mucoid changes and germinal centers. Mucoid changes were common in both diseases. Germinal centers were very rare in both diseases.
Conclusion.
Biopsy specimens obtained from clinically affected joints demonstrate important histological differences between RA and OA. However, the inflammatory features of OA synovitis may sometimes be histologically indistinguishable from rheumatoid synovial infiltration. Assessment of synovium has the potential to provide guidance regarding optimal treatment strategies.

P1323

DO PHYSICIANS FEEL UNCOMFORTABLE WITH MUSCULOSKELETAL COMPLAINTS REPORTED BY THEIR PATIENTS?

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Objective
Identify physicians' perception when seeing patients with non-traumatic musculoskeletal complaints.
Methods
We conducted a cross-sectional study between September 2023 and January 2024 including medical doctors practicing surgical and non-surgical specialties. Rheumatologists and non-clinical specialists were not included. Physicians were invited to respond to a self-administered Google Forms survey, regarding their perception of patients with non-traumatic musculoskeletal complaints.
Results
We included 105 physicians. They were 21 men and 84 women. The mean age was 30.2±3.4 years.
Mean clinical experience was 4±2.1 years. Sixty-three percent of the physicians received training in rheumatology during their medical studies, with an average duration of 2.5±1.5 months [0.5-6 months].
In their daily practice, 40% of the physicians received fewer than 5 patients per week with non-traumatic musculoskeletal complaints, 30.5% saw 5 to 10 patients, 12.4% saw more than 20, and 6.7% did not see any at all.
We found that 53.3% of the physicians felt uncomfortable receiving patients with osteoarticular complaints. Rating this discomfort on a scale of 0 to 5, the average was 1.9±1.4/5. Physicians explained this feeling by stating that these patients were exaggerating when reporting their complaints in 22.9%, 31.4% found it difficult to identify the diagnosis in these patients, 22.9% found that these patients were often not convinced of the diagnosed condition or the treatment approach (20%), 38.1% had the impression that these patients' complaints are consistently recurring, and only one physician believed that some patients denied the chronicity of their illness.
Physicians who have not had a rheumatology training were more likely to feel uncomfortable with these patients (OR=2.9: p=0.012; CI [1.24-6.62]). In addition, discomfort rating was significantly lower in those who have had a rheumatology training (1.7±1.3 versus 2.3±1.6; p=0.034). Female physicians were also more likely to feel uncomfortable (OR=2.8; p=0.04; 95% CI [1.02-7.65]). No significant difference was found between surgical and non-surgical specialties (p=0.806).
During the consultation, 76% of physicians usually or always dedicated time to allow patients to express all their complaints, 5.7% rarely pushed for further questioning, and 31.4% rarely or never performed an osteoarticular examination.
Conclusion
Our study showed that non-rheumatologist physicians, especially those who have not had a rheumatology training, were often uncomfortable receiving patients with non-traumatic musculoskeletal complaints.
Rheumatology training should be encouraged during medical studies for physicians to be more comfortable managing patients with musculoskeletal complaints as they are very common and can reveal serious conditions.

P1324

COMPARATIVE EFFECTIVENESS OF CONVENTIONAL REHABILITATION, GLOBAL POSTURAL REEDUCATION, AND PAIN NEUROSCIENCE EDUCATION IN MANAGING CHRONIC LOW BACK PAIN

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Introduction:
Chronic low back pain is a prevalent and disabling condition with significant physical, psychological, and socio-economic consequences. Effective management requires a multidimensional approach [1]. This study aimed to compare the effectiveness of three distinct rehabilitation strategies: conventional rehabilitation alone, Global Postural Reeducation (GPR), and Pain Neuroscience Education (PNE), each combined with conventional rehabilitation

in addressing pain, functional limitations, and psychological distress in patients with chronic low back pain.

Methods:

A longitudinal comparative study was conducted from March to May 2024, involving patients with chronic low back pain randomized into three groups: a control group receiving conventional rehabilitation alone, a GPR group combining GPR to conventional rehabilitation, and a PNE group combining PNE to conventional rehabilitation. Each intervention lasted four weeks with three one-hour sessions per week. Assessments were conducted at baseline (T0) and after the intervention (T1) using the Visual Analog Scale (VAS) for pain intensity, the Oswestry Disability Index (ODI) for functional impairment, and the Hospital Anxiety and Depression Scale (HADS) for psychological status.

Results:

A total of 48 patients were included in the study, divided into three groups: 24 in the control group, 13 in the GPR group, and 11 in the PNE group. The average age was 51 ± 11 years in the control group, 46 ± 5 years in the GPR group, and 53 ± 9 years in the PNE group. Regarding sex distribution, all participants in the control and GPR groups were female, while the PNE group included 4 males and 7 females. The average BMI was 26 ± 2 Kg/m^2 in the control group, 25.9 ± 3 Kg/m^2 in the GPR group, and 27 ± 4 25.9 ± 3 Kg/m^2 in the PNE group. The average duration of chronic low back pain was 17 ± 2 months in the control group, 18 ± 6 months in the GPR group, and 17 ± 5 months in the PNE group. Following the rehabilitation protocols, pain intensity improved significantly in all groups: from 6.18 ± 1.1 to 3.13 ± 0.3 in the control group, from 5 ± 0.5 to 2 ± 0.1 in the GPR group, while the PNE group achieved the most substantial improvement, with a reduction from 7.18 ± 1.9 to 2.63 ± 0.1, which was statistically superior to the control group (p=0.04). Psychological status also improved across all groups: the control group showed a 7-point decrease from 11 ± 2.3 to 4 ± 0.9, and the GPR group demonstrated an improvement of 7.4 points from 11.07 ± 1.2 to 3.6 ± 0.4. However, the most significant improvement was observed in the PNE group, with HADS scores dropping by 7.9 points from 10.9 ± 2.5 to 3 ± 0.1, a statistically significant difference compared to both the control and GPR groups (p=0.02). Similarly, functional capacity, as measured by the ODI, improved across all groups, with the GPR group achieving the most significant reduction, decreasing from 21% to 8.5% (p=0.03 compared to the control group), while the PNE group showed a reduction of 10.8%, which was not statistically significant.

Conclusion:

This study highlights the effectiveness of combining innovative rehabilitation techniques with conventional approaches in the management of chronic low back pain. PNE was most effective in reducing pain and improving psychological status, while GPR showed superior outcomes in functional capacity. These findings emphasize the value of a multidimensional approach to optimize patient outcomes and recommend the integration of these techniques into routine care.

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P1325

IS THERE AN ASSOCIATION BETWEEN ALBUMIN LEVELS AND THE RISK OF OSTEOPOROSIS IN POSTMENOPAUSAL PATIENTS WITH RHEUMATOID ARTHRITIS ?

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Introduction

Rheumatoid arthritis (RA) is associated with an increased risk of bone loss and fractures due to chronic inflammation. Serum albumin concentration, as a marker of inflammation and nutritional status, could provide a simple tool for screening patients at high risk of osteoporosis.

The aim of this study was to examine the association between serum albumin level and the risk of osteoporosis in postmenopausal RA patients.

Patients and methods

This was a cross-sectional observational study involving postmenopausal patients with (RA). Sociodemographic data and RA-related parameters were collected. Age at menopause, bone mineral density measurements and serum albumin levels were recorded. A low serum albumin level was defined as less than 35g/l.

The "p" significance level was set at 0.05.

Results

A total of 50 patients with a mean age of 61.4 ±8.6 years [41-83] were included. Mean body mass index was 27.1±8.8 kg/m. Thirty-seven patients (74%) were housewives, 6 (12%) were manual workers and 7 (14%) were office workers. Three patients (6%) were smokers. Co-morbidities objectified were high blood pressure (22%), diabetes (8%), heart disease (2%), dyslipidemia (2%) and asthma (2%). The mean age at menopause was 47.1±5.5 years [26-62]. RA was immunopositive in 84% of cases. The treatments received were Methotrexate in 78% of, Leflunomide in 18% and Sulfasalazine in 28%. Thirteen patients (26%) were receiving biotherapy. Thirty-seven patients (74%) received corticosteroid therapy with a mean dose of 6.1±3.6 mg/day and 20 patients (40%) received boluses of methylprednisolone. The mean DAS28 VS activity was 4.1±1.3 [0.97-6.83]. The densitometric data showed a mean femoral T-score of -2.3±1.1 DS and a mean vertebral T-score of -2.1±1.4 DS. Osteoporosis was noted in 35 patients (70%). Thirty-eight patients (76%) were receiving calcium supplements at an average daily dose of 428.5±288.6 mg/d and 40 patients (80%) were receiving vitamin D at an average daily dose of 744 ±435.2 IU/ml. Fourteen patients (28%) were taking bisphosphonates. The mean albumin level was 36.7±6.1g/L [16.9-50] with a mean of 35.6±6.4g/L in patients with osteoporosis and 37.1±5.9g/L in patients without osteoporosis . There was no significant association demonstrated between albumin levels

and the presence of osteoporosis (p=0.4), the mean value of the vertebral T score (p=0.73) and the mean value of the femoral T score (p=0.21). There was no significant association between low albumin levels and the presence of osteoporosis (p=0.77).

Conclusion

Our study showed no association between albumin levels and osteoporosis, mean femoral T-score and mean vertebral T-score, respectively.

P1326

DIFFERENCES IN BONE MINERAL DENSITY IN TYPE 2 DIABETES MELLITUS WITH AND WITHOUT FRAGILITY FRACTURES

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Objective: The study compared the bone mineral density (BMD) difference across the various skeletal sites in individuals with and without fragility fractures and type 2 diabetes mellitus (T2DM). We also correlated the T-score that predicted fracture in our study group to thresholds of osteoporosis treatment in T2DM as per current guidelines.(1)

Material and Methods: In this pilot study, 100 participants with T2DM, recruited across two tertiary care institutes in India, were stratified into two cohorts based on the presence of fragility fractures. Areal BMD (aBMD) at key skeletal sites and trabecular bone score (TBS) were assessed using dual-energy X-ray absorptiometry (DXA). A receiver operating characteristic (ROC) curve analysis was conducted to identify a T-score threshold capable of predicting fractures.

Results: Baseline characteristics comparing the two cohorts are depicted in Table 1. T-scores at the femoral neck (FN) [Mean (SD) - 1.99 (1.09) vs. -1.14 (1.38), p=0.03] and one-third radius (1/3 R) [-3.15 (1.42) vs. -1.45 (1.99), p=0.007] were markedly lower in individuals with fragility fractures compared to those without. Though the T-scores at the lumbar spine (LS) were lower in individuals with fragility fractures, they did not reach statistical significance [-1.76 (2.43) vs -0.82 (1.96), p=0.1]. ROC curve analysis determined that a T-score of -1.65 at FN identified individuals with fragility fractures (p=0.03). A T-score of -1.35 at LS differentiated individuals with fragility fractures (p=0.04).

Conclusion: FN T-scores demonstrated a significant association with fragility fractures in T2DM, with a threshold of -1.65 offering moderate predictive accuracy. Large-scale studies are needed to validate these findings and to assess whether the American Diabetes Association's current recommendation to initiate treatment at a T-score of ≤ -2.0 can adequately identify elevated fracture risk in T2DM.

References

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Table 1: Comparison of characteristics in individuals with and without fragility fractures in Type 2 Diabetes Mellitus

	With fragility fracture (n = 15)	Without fragility fracture (n = 85)	p-value
Gender	*M: 1 F : 14*	*M: 38 F: 47*	*0.005*
Age (years)	67.33 (11.82)	66.4 (9.02)	0.72
Weight (Kilograms)	*56.63 (11.70)*	*66.37 (14.38)*	*0.01*
Height (Centimeters)	*153.36 (7.28)*	*159.74 (9.04)*	*0.01*
BMI (Kg/m2)	23.99 (4.38)	25.97 (5.26)	0.17
Duration of T2DM	10.08 (9.62)	13.80 (10.14)	0.2
HbA1c%	8.12 (3.64)	8.79 (2.57)	0.41
FN aBMD (g/cm2)	*0.76 (0.15)*	*0.88 (0.19)*	*0.03*
FN aBMD T score	*-1.99 (1.09)*	*-1.14 (1.38)*	*0.03*
LS aBMD (g/cm2)	0.97 (0.3)	1.09 (0.24)	0.09
LS aBMD T score	-1.76 (2.43)	-0.82 (1.96)	0.1
Radius aBMD (g/cm2)	*0.57 (0.12)*	*0.72 (0.2)*	*0.007*
Radius aBMD T score	*-3.15 (1.42)*	*-1.45 (1.99)*	*0.002*
TBS	1.28 (0.15)	1.32 (0.11)	0.25

*All continuous variables are expressed in mean (SD)

aBMD: areal bone mineral density; BMI : Body mass index; FN : Femoral neck; LS : Lumbar spine; TBS : Trabecular bone score; T2DM : Type 2 diabetes mellitus

P1327

THE IMPACT OF MEDICAL RECOVERY IN OSTEO-ARTICULAR DISORDERS AT THE HIP LEVEL

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The hip joint is a common joint that helps humans both in walking as well as in practicing the activities of daily life. Its degradation occurs later overloading the joint leading to the appearance of coxarthrosis which, untreated, becomes complicated and is required hip arthroplasty surgery. Most people who suffer from it operation are people aged between 40 and 80 years.

Material and methods:

In this study, we included a number of 20 patients aged between 46-87 years who underwent hip arthroplasty.

For these patients, anamnesis and radiological investigations were used as evaluation methods.

The patients were tested for muscle strength, which is an important benchmark for the program
physical therapy. Pain is a symptom that affects the patients' quality of life, and
this was measured using the VAS Scale.
Results:
30% of patients obtained an increase in muscle strength 4 and 35% of patients muscle strength 5.
From the results obtained from the VAS Scale, only 35% of patients have a score of 1 and 10% have
score 0 due to the physical therapy sessions performed.
Conclusion:
By practicing the exercises from the physical therapy program, most patients
they noticed an improvement in pain.

P1328

ASSESSING THE CORRELATION BETWEEN PAIN SEVERITY AND STRUCTURAL ALTERATIONS IN KNEE OSTEOARTHRITIS: AN IMAGING-IDENTIFIED APPROACH

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Background: Osteoarthritis (OA) is a leading cause of disability worldwide, with pain being its cardinal symptom (1). The mechanisms underlying pain in knee OA (KOA) are multifactorial, ranging from structural injuries to central sensitization. These complex processes contribute to the observed discrepancy between pain severity and structural damage. Imaging techniques, such as radiography and musculoskeletal ultrasonography, are integral to routine clinical practice for assessing structural changes. However, their association with pain severity in KOA remains poorly understood.
Objectives: This study aims to evaluate the role of X-ray and ultrasound-derived parameters of structural damage in relation to pain perception in patients with KOA.
Methods: Sixty-four knees from 38 patients meeting the ACR criteria for KOA were assessed. Pain severity was evaluated using a 100-mm Visual Analog Scale (VAS). Anteroposterior radiographs of fully extended knees in an upright weight-bearing position were obtained and evaluated using the Kellgren-Lawrence (KL) grading system and the OARSI atlas. All patients underwent ultrasonography using a portable MyLab 25 Gold System equipped with an LA435 transducer (Esaote SpA, Genoa, Italy). Two experienced ultrasonographers assessed the presence of synovial thickening, effusion in the suprapatellar bursa, and popliteal cysts. Medial meniscal extrusion, medial and lateral femoral cartilage thickness were measured in both full extension and flexion positions. Femoral osteophytes were semi-quantitatively scored using a 4-grade scale (0-3).
Results: Pain levels significantly differed across the KL groups (p=0.01) and among groups classified according to medial tibiofemoral compartment narrowing, as defined by the OARSI atlas (p=0.05). Other radiographic characteristics from the OARSI atlas did not correlate with pain. Among the ultrasound parameters, medial meniscal extrusion and medial femoral cartilage thickness showed a weak correlation with pain levels (r=0.254, p=0.043; r=-0.265, p=0.034, respectively). However, in multivariate analysis adjusting for age and BMI, these correlations did not remain significant. No associations were found between synovial effusion, popliteal cysts, and pain severity.
Conclusion: Radiography and ultrasonography provide complementary insights into the structural changes in knee OA that may influence pain perception. These imaging modalities can enhance the overall evaluation of KOA patients, though the relationship between structural changes and pain remains complex and warrants further investigation.
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Disclosure of Interests: None declared

P1329

THE INTERPLAY BETWEEN MOOD DISORDERS AND PAIN ASSESSMENT IN PATIENTS WITH CHRONIC INFLAMMATORY ARTHRITIS

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Background: Chronic inflammatory arthritis is a leading cause of pain syndromes in rheumatology (1). Inflammatory joint diseases, including rheumatoid arthritis (RA), ankylosing spondylitis (AS), and psoriatic arthritis (PsA), are among the most prevalent rheumatic conditions that contribute to musculoskeletal pain. The pathophysiology of pain is multifactorial, involving complex interactions of biochemical, biological, physiological, and psychosocial factors. While pain intensity is primarily influenced by the inflammatory activity of the underlying disease, the subjective experience of pain is significantly affected by the psycho-emotional state of the patient, which plays a crucial role in assessing pain severity (2)
Objectives: This study aims to evaluate the intensity of musculoskeletal pain (arthralgia and myalgia) and its correlation with anxiety and depressive mood disorders in a Bulgarian cohort of patients with chronic arthritis.
Methods: This was a single-centre, observational study involving patients diagnosed with chronic arthritis (RA, AS, and PsA)

at the Rheumatology Clinic of "St. Marina" University Hospital in Varna. All participants were diagnosed based on established criteria for specific inflammatory joint diseases and were treated with biologic therapies. Pain intensity (both muscular and joint) was assessed using Visual Analogue Scales (VAS), while anxiety and depression were measured using the Zung Self-Rating Scales for Depression (SDS) and Anxiety (SAS). Laboratory markers of acute-phase inflammation were also assessed. Data analysis included descriptive statistics, one-sample t-tests, correlation analysis, and linear regression, with a significance level set at $p<0.01$.

Results: A total of 130 patients with inflammatory joint diseases (RA, AS, and PsA) were included in the study. The mean age of the cohort was 56.37 years (range 21-76 years), with 41.5% women (n=54) and 58.5% men (n=76). No significant gender differences were found in VAS scores for joint and muscle pain ($p=0.177$ for joint pain and $p=0.717$ for muscle pain). Participants were categorised into groups based on their self-reported depression and anxiety levels (mild, moderate, and severe). Women exhibited higher scores for both depression and anxiety, with significant differences ($p<0.001$ for depression and $p=0.001$ for anxiety). The depression scale (SDS) showed a significant correlation with both muscular and joint pain (SDS and VASm $r=0.666$, $p<0.001$; SDS and VASa $r=0.644$, $p<0.001$), while anxiety (SAS) correlated significantly only with joint pain (SAS and VASm $r=0.698$, $p<0.001$; SAS and VASa $r=0.680$, $p<0.001$). The higher the depression and anxiety scores, the more severe pain patients reported on the pain scales. Inflammatory markers accounted for approximately 8% of the variance in pain levels, with R^2 values of 7.8% for joint pain and 8.1% for muscle pain.

Conclusion: Musculoskeletal pain is a frequent and significant clinical manifestation in chronic inflammatory arthritis. The presence of chronic pain can contribute to emotional dysregulation disorders, such as anxiety and depression. The intensity of pain experienced by patients correlates significantly with their emotional state, highlighting the importance of addressing both physical and psychological factors in the management of chronic inflammatory arthritis.

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P1330

MUSCULOSKELETAL DISORDERS AMONG HEALTHCARE PROFESSIONALS: PREVALENCE AND RISK FACTORS

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Objective:
The aim of our study was to determine the prevalence of Musculoskeletal disorders (MSDs) among paramedical staff as well as the risk factors that may influence their occurrence.
Methods:
We conducted a cross-sectional study among paramedical staff at the Maternity and Neonatology Center of Tunis between July 2023 and March 2024. The participants included midwives, nurses, laborers, and supervisors. Sociodemographic characteristics and job-related data were collected using an interviewer-administered questionnaire.
The prevalence and severity of MSDs were assessed using the French version of the Nordic questionnaire.
Results:
The study included 80 paramedical staff members distributed across different roles: 43 nurses (53.8%), 17 laborers (21.3%), 13 midwives (16.3%), and 7 supervisors (8.8%). The sex ratio (M/F) was 0.27. The average age of participants was 49 ± 9 years, and the average work duration was 20 ± 8 years. Regarding working conditions, participants worked an average of 40 ± 7 hours per week, spread over 5 ± 1 days, with a mean of 2.3 ± 1 nightshifts per month. They took an average of 1.05 ± 0.75 breaks per day.
The prevalence of MSDs was 91%, distributed as follows: knees (60%), neck (57%), shoulders (55%), lower back (52%), wrists (47%), upper back (40%), fingers (37%), ankles (37%), elbows (26%), and hips (25%). The presence of MSDs was significantly correlated with older age ($p=0.03$) and the number of hours worked per week ($p=0.04$).
No correlation was found between MSDs and the number of working days per week ($p=0.208$), nor with the number of night shifts per month ($p=0.133$) or breaks per day ($p=0.600$).
Conclusion:
Our study confirmed the high prevalence of MSDs among paramedical healthcare staff, particularly in the knees. Age and the number of working hours appear to be risk factors for their occurrence.

P1331

CORTICOSTEROID INJECTIONS COMPARED TO PRP INJECTIONS FOR TREATING SHOULDER TENDINITIS

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Objectives:
To compare the two treatments in terms of pain reduction and improvement in shoulder function.
Material and Methods:
A prospective study was conducted over a 5-month period at the Rheumatology Department of Charles Nicolle Hospital in Tunis. Patients with simple tendinitis were enrolled and divided into two groups: one group received corticosteroid infiltrations, and the other received PRP injections. Assessments were carried out at baseline (T0), one week (T1), and three months (T2). The outcome measures included pain using the Visual Analog Scale (VAS), the Quick Disabilities of the Arm, Shoulder, and Hand (QuickDASH) questionnaire, and the Shoulder Pain and Disability Index (SPADI) questionnaire.
Results:
The study included 37 patients, consisting of 6 men and 31 women, with an average age of 63 ± 8 years. Sixteen patients were diabetic. Tendinitis was present on the right side in 70% (n=26) of the cases. The average duration of symptoms was 37 ± 26 months. 21 patients received corticosteroid infiltrations, and 16 received PRP injections. Regarding prior treatments, all patients had used paracetamol, 70% (n=26) had taken oral nonsteroidal anti-inflammatory drugs (NSAIDs), and 89% (n=33) had used local anti-inflammatory treatments. Rehabilitation was performed in 32% (n=12) of the cases.
The average pain score on the VAS in the corticosteroid infiltration group was 7 at baseline (T0), 5 at one week (T1), and 3 at three months (T2). In the PRP group, the scores were 7 at T0, 6 at T1, and 5 at T2.
The mean QuickDASH scores were 51% and 55%, respectively, at T0, 47% and 51% at T1, and 33% and 45% at T2 for the corticosteroid and PRP groups. For the SPADI, the mean pain, disability, and total scores in the corticosteroid group were 68%, 51%, and 58% at T0, 63%, 51%, and 56% at T1, and 42%, 37%, and 40% at T2. In the PRP group, these scores were 69%, 48%, and 56% at T0, 66%, 48%, and 55% at T1, and 55%, 40%, and 39% at T2.
Pain assessment showed improvement in both groups at T1 with no statistically significant difference (p=0.7).
However, corticosteroid infiltrations provided better pain relief at T2 (p=0.02).
Both treatments led to functional improvements. However, no statistically significant difference was observed
between the two groups in terms of QuickDASH (p=0.6 at T1, p=0.3 at T2) or SPADI (pain: p=0.7 at T1, p=0.2 at T2; disability: p=0.7 at T1, p=0.7 at T2; total: p=0.8 at T1, p=0.9 at T2).
Conclusion:
According to our study, corticosteroid infiltrations provide better long-term pain relief compared to PRP injections in the treatment of simple shoulder tendinitis, but both treatments are equally effective in improving function.

P1332

BIOLOGICAL TREATMENT USE IN RHEUMATOID ARTHRITIS: WHAT IS THE IMPACT OF SOCIODEMOGRAPHIC AND CLINICAL FACTORS?

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Objective:
In our study, we focused on the sociodemographic and clinical factors related to the resort to biological treatment in RA.
Methods :
We conducted a cross-sectional study among patients diagnosed with RA at a tertiary care university hospital in Tunisia. Sociodemographic, clinical, biological, and follow-up characteristics were collected.
Results :
We included 284 patients diagnosed with RA. The mean age was 60.21 ± 11.2 years, with 83.5% of women. The mean age at diagnosis was 49.33 years, and the mean diagnostic delay was 51.6 ± 62.7 months. Twenty percent were active smokers. Comorbidities including diabetes, hypertension, and dyslipidemia were noted respectively in 23.9, 29.2, and 17.6% of patients. Fibromyalgia was found in 10% of patients. Half of the patients (56.6%) had a sedentary lifestyle. Approximately, 52% of patients were of rural origin. Only 21.4% have reached the secondary education level, while 41% were illiterate. An average of 65.4% were unemployed. Polyarticular onset pattern was seen in 89% of patients, and oligoarticular in 10%. Rheumatoid factor (RF) and anticitrullinated peptide antibodies (ACPA) were positive respectively in 86.6 and 72.5%. Four percent of patients were on corticosteroids with an average dose of 7 ±2.8 mg/l. The delay between positive diagnosis and initiation of methotrexate was 10.6 ± 7.4 months.
Combination therapy (3 concomitant csDMARDs) was noted in 16.2% of patients. Seventy-two percent adhered to their treatment.
A significant correlation was noted between the switch to biological treatment and the number of comorbidities per patient (p=0.007), diabetes (p<0.001), hypertension (p=0.028), sedentary lifestyle (p=0.017), and living in urban areas (p=0.033).
Mood disturbances are insignificantly correlated to the resort to biological treatment (p=0.062).
Conclusion:
Treatment options for rheumatoid arthritis (RA) have evolved beyond traditional disease-modifying antirheumatic drugs (DMARDs) to include biologic DMARDs. Demographic factors as-

sociated with the resort to bDMARDs include diabetes, hypertension, sedentary lifestyle, and urban origin.

P1333

DISEASE-RELATED FACTORS ASSOCIATED TO THE INTRODUCTION OF BIOLOGICAL TREATMENTS IN RA PATIENTS

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Rheumatoid arthritis (RA) is a chronic inflammatory disorder characterized by symmetrical joint involvement and persistent arthritis. Effective disease management relies on the early initiation of disease-modifying antirheumatic drugs (DMARDs). we aimed to determine the disease-related and management characteristics leading to the use of biological treatments in patients with RA.

Methods :

We conducted a cross-sectional study among patients diagnosed with RA at a tertiary care university hospital in Tunis. Sociodemographic, clinical, biological, and follow-up characteristics were collected.

Results :

We included 284 patients diagnosed with RA. The mean age was 60.21 ± 11.2 years, and the sex ratio (M/F) was 0,2. The mean age at diagnosis was 49.33 years, and the mean diagnostic delay was 51.6 ± 62.7 months. Comorbidities including diabetes, hypertension, and dyslipidemia were noted respectively in 23.9, 29.2, and 17.6% of patients.

Polyarticular onset pattern was seen in 89% of patients, and oligoarticular in 10%. At diagnosis, 35% had extraarticular manifestations, 42% had joint deformities, and 91% had erosive RA. Rheumatoid factor (RF), antinuclear antibody (ANA), and anticitrullinated peptide antibodies (ACPA) were positive in 86.6%, 42%, and 72.5%, respectively. Ten percent of patients developed Coxitis and 10.2% antlanto-axial instability. The mean C-reactive protein (CRP) level was 35 ± 37 mg/L, and the disease activity score 28 with CRP (DAS28(CRP)) was 5.2 ± 3.4 indicating high disease activity. Eighty-four percent of patients were on corticosteroids with an average dose of 7 ±2.8 mg/l. thirty-two percent of patients have received leflunomide (LEF), 64% sulfasalazine (SLZ), and 99% have received methotrexate (MTX). The delay between positive diagnosis and initiation of methotrexate was 10.6 ± 7.4 months. Combination therapy (3 concomitant csDMARDs) was noted in 16.2% of patients. Seventy-two percent adhered to their treatment.

A significant association was found between the use of bDMARDs and positive ANA (p=0.05), previous SLZ (p<0.001), and LEF intake (p<0.001), advanced age at diagnosis (p=0.012), and combination therapy (p<0.001).

However, the value of the DAS28(CRP) at diagnosis was not correlated to the use of biological treatment (p=0.06).

Conclusion: The use of bDMARDs revolutionized the management of patients with RA. Positive ANA, previous SLZ and LEF use, advanced diagnosis age, and combination therapy seem to influence their introduction.

P1334

CLINICAL APPROACH OF THE TREATMENT OF SYMPTOMATIC OSTEOPOROSIS IN THE ELDERLY: COMPARISON BETWEEN AGE RANGES

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Objective: To analyze the clinical approach to treating symptomatic osteoporosis in elderly patients, stratified by age ranges, and to identify patterns of diagnostic and therapeutic management.

Material and Methods: This retrospective observational study reviewed the clinical records of elderly patients aged ≥65 years diagnosed with symptomatic osteoporosis in geriatric department of a tertiary care hospital in Spain. Patients were categorized into two age groups: 65–84 years (younger old, YO) and ≥85 years (older old, OO). Key variables assessed included demographics, comprehensive geriatric assessment (clinical, functional and psychosocial variables), the frequency of bone mineral density (BMD) evaluations, vertebral fracture assessments, initiation of anti-osteoporotic therapies, adherence and tolerability, refracture and mortality in patients with a minimun period of follow-up required of 13 months (mean folow-up for the sample 24 months).

Results: A total of 168 patiens were analyzed (91 YO mean age 79.45±4,35 years, 77 OO, mean age 87.99±2,75 years). BMD testing was performed more frequently in the YO group (88.88% vs. 76.79%). Vertebral fractures were underdiagnosed in both groups but identified more often in the YO group (17.6% vs. 29.7%). Anti-osteoporotic treatment was initiated in both groups in 100% of patients. Denosumab was more frequently prescribed in the OO group (48.4% vs. 67.5%). Other treatments like biphosphonates (36.3% vs. 23.0%) or teriparatide (15.4% vs. 6.8%) were more frequently used among YO patients. Refracture during follow-up occurred in 11.76% (4) of the YO group vs 15.74% (9) of the OO, with no statistical difference; mortality was 17.65% (6) of the YO group vs 14.04% (8). We did not find in our study differences among both groups in terms of basal functional status (Barthel, Physical Red Cross and Lawton indexes), treatment tolerability, secondary effects nor adherence.

Conclusion: The clinical approach to treating symptomatic osteoporosis differs significantly between age ranges, with a notable decline in diagnostic measures in patients ≥85 years. Although pharmacological approach may differ, both groups have similar results in therms of mortality and refracture. Assuming that all these patients are at high risk of new fractures, therapeutic abstention it is no longer an option.

P1335

SARCOPENIA: TODAY HOW TO TREAT IT

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Sarcopenia is more common in elderly and senile people, due to the progressive and generalized loss of muscle mass with impaired skeletal muscles. Sarcopenia can occur in violation of nutrition, a decrease in physical activity.

Objective. Adverse outcomes of sarcopenia are falls and fractures. Fractures lead to a decrease in the functional activity of patients, increase the risk of death from all causes, especially in elderly and senile people.

Methods. The study includes 140 people, of which 75 men (53.57%) and 65 women (46.47%), age median - 73 [68; 78] years. Sarcopenia diagnostics were carried out using the criteria Foundation of NIH Sarcopenia (FNIH), European Working Group on Sarcopenia in Older People (EWGSOP2), Sarcopenia Definition and Outcomes Consortium, SDOC Global Leadership Initiative in Sarcopenia (GLIS). To evaluate risk factors, logistic regression analysis and the method of classification criteria were used. Patients were prescribed by native forms of vitamin D3 as drug therapy.

Results. In the sample of patients aged ≥65 years, the frequency of sarcopenia varied from 14.5 to 33%, depending on the diagnostic criteria used. When using the diagnostic criteria EWGSOP2, sarcopenia was detected in 27.5% of patients over 65 years old. The frequency of sarcopenia increased with age, reaching 58.7 % in people 85 years old and older. Significant risk factors were the age of ≥77 years (p=0.023), body mass index BMI <24 kg/m^2 (p<0.001), as well as level 25(OH)D less than 21.7 ng/ml (p=0.007), C-reactive protein (CRP) ≥6.7 mg/l (p<0.001), total blood protein <65 g/l (p<0.001) and estimated glomerular filtration rate (GFR)<60 ml/1.73 m^2 according by the formula GFR-EPI (p=0.004). For treatment, native forms of vitamin D3 were prescribed. As a result of prolonged therapy, we observed an improvement in the function of skeletal muscles (p<0.001).

Conclusion. Sarcopenia is a common disease in elderly and senile people, regardless of the diagnostic criteria used. Native forms of vitamin D3 have a beneficial effect on the function of skeletal muscles.

P1336

USING A SCREENING OF RESPIRATORY SARCOPENIA IN GERIATRIC PRACTICE

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Respiratory sarcopenia (RS) is significant for predicting the outcome of sarcopenia in patients in geriatric practice.

Objective. The purpose of the study: to evaluate the peak expiratory flow rate in geriatric patients with various sarcopenic phenotypes and without sarcopenia.

Methods. 67 patients (45 women, 22 men) were examined: 15 - with the presence of sarcopenia, 25 with the presence of sarcopenic obesit, 14 - with obesity without sarcopenia, 17 - without obesity and sarcopenia. Diagnosis of the sarcopenic phenotype was carried out according to the protocol of the European group for the study of sarcopenia. In order to evaluate the peak expiratory flow rate (l/min) was carried out picfluometry.

Results. The average age of the participants was 74.3±6.2 years, the groups were comparable by age. The peak expiratory flow rate was reduced in all groups of patients, but the smallest values of the peak expiratory flow rate were noted in groups of patients with sarcopenia 255 (200; 310) and sarcopenic obesity 216.75 (166; 267.5) without statistically significant differences between these groups (p=0.77). In a group of patients with obesity of the peak expiratory flow rate amounted to 390 (300; 480). In a group without sarcopenia and obesity, the highest indicators of the peak expiratory flow rate 400 (325; 465) are noted. Significant differences in the peak expiratory flow rate were obtained between groups of patients with different sarcopenic phenotypes and these groups (p=0.004–0.019). The connection of muscle strength and peak expiratory flow rate is confirmed by statistically significant straight correlation interconnections of the indicators of the peak expiratory flow rate and hand dynamometry (right, left) in all compared groups. In the group of sarcopeneic obesity: right hand dynamometry and peak expiratory flow rate (r=0.57, p=0.003), left hand dynamometry and peak expiratory flow rate (r=0.58, p=0.016). In the group of sarcopenia, right hand dynamometry and peak expiratory flow rate (r=0.57, p=0.015), left hand dinamometry and peak expiratory flow rate (r=0.59, P=0.013). In the united group of patients without sarcopenia, right hand dynamometry and peak expiratory flow rate (r=0.55, p=0.02), left hand dynamometry and peak expiratory flow rate (r=0.67, p=0.0022). The most pronounced correlation of the peak speed of exhalation with the compression force of the left hand is noted in the group without sarcopenia.

Conclusion. Picfluometry is a widely accessible method for diagnosing respiratory sarcopenia. The peak expiratory flow rate is significantly reduced in patients with different sarcopenic phenotypes. The indicator of the peak expiratory flow rate can be the initial test of assessment of the weakness of the respiratory muscles.

P1337

OSTEOPOROSIS AND NON-ALCOHOLIC FATTY LIVER DISEASE: COMORBIDITY ISSUES

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Comorbidity of non-alcoholic fatty disease of the liver and osteoporosis is due to general pathogenetic mechanisms.

Objective. Assess the condition of bone tissue in patients with non-alcoholic fatty liver disease.

Methods. The study was attended by 55 women with non-alcoholic fatty liver and 27 women without liver damage over 50 years old. The investigation criteria in the study was: the presence/absence of ultrasound signs of non-alcoholic fatty liver disease, the exclusion of viral liver damage, and the exclusion of alcohol consumption in hepatotoxic doses.

In order to verify the diagnosis, an ultrasound examination (US) of the abdominal cavity, densitometry with the determination of the T-cross of the hip and the lumbar spine, biochemical indicators of blood (bilirubin, alanine aminotransferase, aspartate aminotransferase, alkaline phosphatase, glucose in serum blood, gamma-glutamyltranspeptidase).

Based on the results of blood tests and an ultrasound of the liver, patients were divided into 3 groups. The first group of 35 people with liver steatosis, the second group – 15 patients with steatohepatitis. The control group was 15 women without liver damage.

Results. The average values of the T–criteria in the first and control groups did not have differences (liver steatosis: -0.73±0.54 SD in the femoral neck and -0.85±0.64 SD in the lumbar spine; control: -0,51±0.42 SD in the femoral neck, -0.76±0.38 SD in the lumbar spine). In a group of patients with steatogepatitis, the values of T-criteria were significantly ($p<0.05$) lower in both areas of the study (-1.76±1.012 SD in the femoral neck and -1.63±0.96 in the lumbar spine). Individual indicators of T-criteria revealed that in a group with liver steatosis, osteoporosis was observed in 8 (22.8%), osteopenia-11 (35.1%) examined persons. In the control group, the frequency of detection of osteoporosis and osteopenia statistically did not differ from the first group (two (13.3%) and three (20%) of the patient, respectively). In the second group of patients with steatogepatitis, the frequency of detection of osteoporosis was significantly ($p<0.05$) higher (7 (46.6%) patients); osteophenia was observed in 3 (20.0%) patients.

Conclusion. The identified decrease in the mineral density of bone tissue with non-alcoholic fatty liver disease at the stage of steatogepatitis increases the risk of osteoporosis.

P1338

RHEUMATIC DISEASES: FOCUS ON VITAMIN D

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Background. Vitamin D deficiency is a pathological condition that leads to a violation of calcium metabolism and affects the rate of development of osteoporosis.

Objective. Conduct a clinical examination of patients and determine the content of vitamin D in the blood.

Methods. A clinical examination of patients with the determination of the content of vitamin D in the blood was carried out.

Results. The age of the examined was from 25 to 75 years, the average age was 50.6±17.0 years. The gender composition was represented by women (83%). The structure of nosological diagnoses was predominated by rheumatoid arthritis (46.4%), osteoarthritis (33.5%), systemic scleroderma (7.5%), hypermobility of the joints (3.5%), rheumatic polymialgia (3.4%), hyperuricemia (5.7%). The study of vitamin D was carried out only in 70% of patients aimed at the rheumatologist. The level of vitamin D in these patients did not reach the lower boundary of the target values and was in the range from 15.2 to 28.5 ng/ml; the average level was 19.5±6.9 ng/ml. Vitamin D levels were distributed as follows: 45% of people had a deficiency and 55% of people – vitamin deficiency in the blood. Among persons with violations of vitamin D levels (deficiency, insufficiency), the intake of glucocorticoids (prednisolone, methylprednisolone) was observed in 22.5% of the examined, the use of proton pump inhibitors – in 50%.

Conclusions. In the structure of nosological diagnoses in patients directed to the rheumatologist, rheumatoid arthritis and osteoarthritis prevail. The insufficient study of the level of vitamin D in patients with a rheumatological profile (only 70% examined) is noteworthy, and its average level corresponds to a deficiency (19.5±6.9 ng/ml). There is a high prevalence of risk factors for the development of osteoporosis in examined patients: female gender (83%), age (average age – 50.6±17.0 years), the use of drugs (50% are taken by proton pump inhibitors, 22.5% – glucocorticoids). It is necessary to include a study of vitamin D levels in the mandatory standard of examination in patients with a rheumatological profile.

P1339

RETROSPECTIVE SINGLE-CENTER STUDY ON THE RADIOLOGICAL PROGRESSION OF NON-RADIOGRAPHIC AXIAL SPONDYLOARTHRITIS

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Background: At present, nr-ax SpA is considered to be the early phase of AS. However, there is sufficient evidence that not everyone progresses in the phase of structural changes, and that there are individual rates of development of the disease. Different patient risk characteristics for progression to AS are discussed in the literature. Objectives: To establish the progression of nr-ax SpA to radiographic spondyloarthritis in patients in the Bulgarian population and to indicate the factors associated with it.
Methods: A retrospective single - center study was conducted in patients previously diagnosed with nr-ax SpA in a study conducted in patients from Bulgaria in the period August 2022 to April 2023. Patients who had a rheumatologist confirmed diagnosis of nr-ax SpA were eligible to participate. All patients met ASAS criteria for IBP with duration from 3 months to 2 years, had no changes reported after the conventional X-ray of the sacroiliac joints and a performed subsequent MRI. Sacroiliac joint inflammation was assessed using the Canadian Spondyloarthritis Research Consortium (SPARCC). This study included an assessment of disease activity in the last month from the date of the visit, functional assessment of the patient, analysis of conventional radiographs and MRI of sacroiliac joints or spine performed during the last 12 months before the visit, as well as available composite indices for assessing disease activity.
Results: A total of 62 patients with previously diagnosed non-radiographic SpA were included in this analysis. A higher proportion of patients were male patients (61% vs 39%). The mean age was 38.7±6.51 with mean symptoms duration 5.62±1.36 years. The burden of disease activity measured by BASDAI, ASDAS-CRP and VAS as well as ASQoL did not differ in 62% (n=38) of the patients compared with the data recorded in their last visit (p>0.05). In n=18 (29.03%) consecutive MRI of sacroiliac joints was found in the last 6 months and according to the ASAS criteria remained in the group of patients with nr-ax SpA. Patients who indicate that they have a control MRT without changes and who have no complaints in the last 6 months are 10 (16.12%). In n= 14 (22.58%), objective evidence of clinical and laboratory disease activity was available, but for various reasons, no rheumatologist was visited after the nr-ax SpA diagnosis was made. In 32.25% (n=20) we found progression for the disease to our radiographic phase. Of these, NSAID-treated patients were 6.4% (n=4), 25.% (n=16) were treated with biologically DMARDs, with 9.67% with initiated second biological DMARDs (due to inadequate disease activity control). We found that patients with progression of nr-ax SpA to AS were 80% (n=18) male, 85% (n=17) carriers of HLA B27. They were characterized by baseline elevated CRP values at 95% (n=19) and SPARCC >25 at 75% (n=15). In 75% (n=15) of patients with radiographic progression, the onset of symptoms was before the age of 30.
Conclusion: Nr-ax SpA is a disease characterized by comparable levels of disease activity and functional limitation to patients with AS. We found radiographic structural changes in approximately one-third of patients, and among the factors associated with progression are HLA B27, high levels ot initial biomarkers of inflammatory activity, male sex, early onset of symptoms, and high degree of sacroiliac joints involvement at baseline.

P1340

THE POSSIBLE INVOLVEMENT OF THE ENDOCANNABINOID SYSTEM IN THE TUMORAL CALCINOSIS-ASSOCIATED CALCIFIED LESIONS: A PRELIMINARY STUDY

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Objectives: Tumoral calcinosis (TC) is an extremely rare condition characterized by lobular calcified masses in the periarticular soft tissues. We have previously characterized a TC-stem cells (SCs) line (TC1-SC) from a primary cell line obtained from a TC biopsy. Since over the last years increasing evidence suggested the involvement of the endocannabinoid system (ES) in the regulation of bone remodeling, we investigated the possible mechanisms underlying TC progression, focusing on the role of ES in TC.
Methods: After the establishment and characterization of TC1-SCs by using cellular and molecular assays, we analyzed the expression of the osteogenesis-related and the ES components genes during the osteogenic differentiation up to 21 days. Furthermore, ALP activity and calcium-phosphate deposition were quantified by fluorometric assays during the osteogenic differentiation of TC1-SCs treated with different concentrations of anandamide (AEA) (i.e., 1nM, 10nM, 100nM, 1μM, and 10μM), a partial agonist of both CB1 and CB2 receptors.
Results: Our preliminary results revealed not only the presence of the ES components (i.e., *CNR1*, *CNR2*, *NAPE-PLD*, *FAAH*, and *DAGLα*) in the TC1-SCs line but also their positive modulation during the osteogenic differentiation process. Preliminary data obtained from the fluorometric analysis showed that all the tested concentrations of AEA caused significant increases in the production of hydroxyapatite crystals compared to the control cells.
Conclusions: In this study, we demonstrated for the first time the presence of ES components in TC, identifying a significant upregulation of the ES-related genes during the osteogenic differentiation. Considering that activation of the CB2 receptor plays an im-

portant role in osteogenic differentiation as well as we observed in this study, we are currently evaluating whether the *in vitro* treatment with a potent and selective CB2 receptor antagonist, could hamper the calcium deposition typically found around large joints in TC patients. These preliminary data could provide a basis not only to evaluate how the ES could be relevant in TC pathogenesis but also to identify novel molecular targets for developing TC-targeted therapies.

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P1341

MOLECULAR CHARACTERIZATION OF THE EFFECTS OF CALCIFEDIOL ON IN VITRO HUMAN PREOSTEOBLASTIC CELL MODELS

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Objectives: Notably, calcifediol can modulate the transcriptome through the VDR interaction. Emerging evidence revealed that calcitriol also regulates the expression of a subset of miRNAs with potential regulatory functions in cancer pathways. In this study, we investigated not only the ability of calcifediol to affect the osteogenic differentiation process of mesenchymal stem cells derived from human adipose tissue (hADMSCs) but also to modulate the expression of osteogenic-related genes and miRNAs.

Methods: Two hADMSCs lines were prepared from subcutaneous adipose tissues obtained from health donors. Cells were exposed to different concentrations of calcifediol (10μM, 100nM, 50nM, and 10nM) in osteogenic induction medium for 35 days and the osteogenic phenotype was evaluated by fluorometric assays. In addition, we investigated the expression of a panel of genes and miRNAs involved in osteogenesis for up to 21 days in osteogenic differentiated cells.

Results: Our data showed that ALP activity and mineralization of hADMSCs were both affected by the presence of calcifediol. These results were consistent with miRNAs analysis where we found, depending on the cell line where we investigated the calcifediol-related effects, a higher level of expression at 14 or 21 days of those miRNAs that have been reported to positively regulate the osteogenic process (i.e., miR-27a-3p, miR-29a-3p, miR-125a-5p, and miR-196b-5p) in cells exposed respectively to 100nM and 50nM calcifediol. Preliminary data showed that 10μM calcifediol upregulated the expression of early and late key osteogenic genes (i.e., *RUNX2*, *COL1A1*, and *OCN*) as well as increased the *RANKL*/*OPG* mRNA ratio.

Conclusions: Here, we showed that calcifediol promoted the hADMSCs osteogenic differentiation either by enhancing ALP activity or by inducing extracellular matrix mineralization. Furthermore, we observed that physiological concentrations of calcifediol increased the expression of pro-osteogenic differentiation miRNAs. In this regard, we are currently evaluating whether the different concentrations to which we have observed such modulation could be ascribed to the different expression of *VDR* mRNA on the two hADMSCs lines. These findings could allow the design of novel therapeutic applications of this molecule against metabolic bone diseases in the future.

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P1342

SEARCHING FOR THE 'WINNER' HIP FRACTURE PATIENT: THE EFFECT OF MODIFIABLE AND NON-MODIFIABLE FACTORS ON CLINICAL OUTCOMES FOLLOWING HIP FRACTURE SURGERY

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Objectives: Various factors, other than the quality of surgery, may influence clinical outcomes of hip fracture patients. We aimed to evaluate the relative impact of several factors on functional outcome, quality of life, re-fracture and mortality rates following surgery for hip fractures.

Material and Methods: We studied 498 (62.2%) women and 302 (37.8%) men with a mean age of 81.3 years (range, 60–95) with hip fractures (femoral neck and pertrochanteric). The mean follow-up was 74 months (range 58–96). Various patient-related and surgery-related parameters were recorded and correlated to both objective and subjective mobility, functional recovery and quality of life scales. Mortality and re-fracture rates were also evaluated.

Results: Using multiple regression analysis, age >80 years (p = 0.000; 95% CI, 1.077–1.143) and ASA score III and IV (p = 0.000; 95% CI, 2.088–3.396) (both non-modifiable factors) both proved to be independent (s.s.) factors affecting mortality rates. Age <80 years (p = 0.000; 95% CI, 0.932–0.974), surgery delay less (modifiable factor) than 48 hours (p = 0.046; 95% CI, 0.869–0.999), low dementia CDR index (p = 0.005; 95% CI, 0.471–0.891) (non-modifiable factor), and osteoporosis medical treatment (modifiable factor) (p = 0.006; 95% CI, 0.494–0.891) were shown to be independent (s.s.) factors affecting HOOS-symptoms. Osteoporosis medical treatment used proved to be an independent (s.s.) factor affecting HOOS-daily activities (p = 0.049; 95% CI, 0.563–1.000) and quality of life (E-Qol-5D) (p = 0.036; 95% CI, 0.737–1.325).

Conclusion: A hip fracture patient aged <80 years old, with an ASA I-II, with low dementia CDR index and on osteoporosis medication has a better chance of an improved outcome (winner patient).

P1343

PREVALENCE OF SMARTPHONE ADDICTION AND ITS IMPACT ON MUSCULOSKELETAL DISORDERS

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Introduction : In the digital age, smartphone use has become ubiquitous, particularly among medical students, who are exposed to risks associated with excessive use. The aim of this study was to determine the prevalence of smartphone addiction, its association with musculoskeletal disorders (MSDs).

Patients and Methods : A cross-sectional analytical survey was conducted among medical students at the Monastir Faculty of Medicine using a self-administered questionnaire. The tools used included the SAS-SV for addiction assessment, the modified Nordic scale and Neck Disability Index (NDI) for MSD, the PHQ-9 for depression, and the ISI scale for sleep quality.

Results : Of the 203 students who took part in the study, 43.3% were smartphone addicts. MSDs were found in 70.9% of participants, with a marked prevalence of neck pain (49.3%), followed by lower back pain (43.8%) and upper limb pain (35.5%). In addition, 29.6% of participants suffered from depression, and 27.1% from insomnia. Multivariate analysis showed a significant association between smartphone addiction and intensive use after waking up (ORa = 0.97, P = 0.00), frequent checking of the device (ORa = 1.16, p = 0.01), low back pain (p=0.00; ORa=4.44), shoulder/arm pain (p=0.00; ORa=0.29), and insomnia (p=0.00; ORa=2.73).

Conclusion : Smartphone addiction was common among medical students. Education on sleep hygiene and the adoption of support measures for addicted students would be necessary to reduce the harmful consequences of excessive smartphone use on students' physical and mental health.

P1344

DEGENERATIVE LUMBAR SPINAL STENOSIS IN THE ELDERLY: EPIDEMIOLOGICAL PROFILE AND THERAPEUTIC MANAGEMENT

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Introduction:
Lumbar spinal stenosis (LSS) can cause symptomatic neurogenic claudication alongside radicular pain and weakness. It is frequent in the elderly. The aim of this study was to describe the epidemiological profile, radiological aspects as well as therapeutic modalities of lumbar stenosis in the elderly.

Patients and methods:
A retrospective study carried out over a period of 3 months on patients aged over 65 years, followed in physical medicine for lumber spinal stenosis. Clinical, radiological, and therapeutic data were collected.

Results:
Fifty patients were included in this study with a sex ratio-ratio of 0.5. Their mean age was 73 years. In their medical history, 55.8% were hypertensive, 77.6% diabetic and 33% had dyslipidemia. All patients had a history of chronic low back pain evolving since an average of 2 years.
Lumbar pain was the most frequent reason for consultation (80%): unilateral in 45% of patients and bilateral in 55% of the cases, associated with radicular claudication in 80% of cases and urinary disturbances in 25% of the cases. Physical examination showed spinal syndrome in 75% of cases, radicular syndrome in 48% of cases and pathological neurologic signs in 22% of cases. On imaging, LSS had varied etiology: disc herniation (35%), facet hypertrophy (45%), cyst formation (25%) and ligamentous hypertrophy.
All patients received medical treatment associated with an individualized rehabilitation program. Epidural corticosteroid injection was done in 55% of cases.

Conclusion:
Lumbar spinal stenosis (LSS) is a debilitating condition associated with degeneration of the spine with aging. It requires multidisciplinary management based on conservative treatment in the first line.

P1345

ASSOCIATION BETWEEN CATASTROPHIZING AND FUNCTIONAL LIMITATION IN PATIENTS WITH KNEE OSTEOARTHRITIS

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Introduction :
Knee Osteoarthritis (KO) is a frequent reason for consultation responsible for pain and restriction of autonomy. The aim of this study was to determine the association between catastrophism and functional limitation in patients undergoing Physical and Rehabilitation Medicine PRM for KO.
Patients and methods:
An analytical cross-sectional study was conducted in the physical medicine department. Demographic data, history of KO as well as the Kallegren and Lawrence radiographic stage were collected. Functional discomfort was assessed using the Lequesne knee index and catastrophism was assessed by the PCS questionnaire in its version translated and validated in Arabic.
Results:
We included 90 patients with a mean age of 58.76 ± 9 years. Most were women (88.9%) and 44.4% of them were obese. KO was bilateral in 73.3% of cases. The mean Visual Analog Scale (VAS) for pain at rest was 29.18 ± 19.69 and on walking was 57,14 ±15,81.

The mean Lequesne score in our population was 11.33 ± 3.53 and the PCS score 23.91 ± 11.28. The factors associated with a statistically significant high level of catastrophizing were level of education (p= 0.04), obesity (p=0.007), radiological stage (p= 0.048), Lequesne index (p= 0.019), and the components of the HAD score (p< 10-3).
Conclusion:
Catastrophism influences the severity of KO by exacerbating the perception of pain and limiting patients' functional abilities. It should be assessed during follow-up of these patients in order to adapt therapeutic strategies.

P1346

USE OF COMPLEMENTARY AND ALTERNATIVE MEDICINE IN DEGENERATIVE DISEASES: IMPACT ON PAIN AND FUNCTIONAL STATUS

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Introduction:
Complementary and alternative medicine (CAM) is an approach to health care based in treatments different from those of conventional medicine. The use of CAM has grown significantly in recent years.
The aim of this study was to evaluate tendancy of use of alternative medicine and its effectiveness on pain, functional status on patients suffering from degenerative diseases (common low back pain, cervicarthrosis and gonarthrosis)
Methods:
This was a descriptive cross-sectional study including patients followed in our consultation for degenerative diseases (gonarthrosis, low back pain and cervicarthrosis). Patients were asked about the use of CAM, types of therapies used, the reasons for using these medicines and factors associated with their use.
Results
Eighty four patients were included in this study, 55.9% of them had used CAM at least once in their lives, 47.4% reported starting the use of CAM before the declaration of their illness. Sixty three percent of patients reported using CAM for pain relief, while 36.8% hoped for a cure. Regarding types of CAM, 52.6% of patients used cupping (El hijama), 47.4% used essential oils, 9% took herbal medicine and 5% opted for acupuncture. Not all patients informed their doctor about their use of CAM, 94.7% of the patients thought that CAM could not have any adverse effects and the majority thought that CAM was effective.
Conclusion:
In our study, the prevalence of CAM use remains high, with different types used, namely cupping and essential oil therapy.

P1347

COMPARING THE EFFECTIVENESS OF MANUAL THERAPY AND NEURODYNAMIC TECHNIQUES IN MANAGING MODERATE IDIOPATHIC CARPAL TUNNEL SYNDROME

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Introduction: Carpal tunnel syndrome (CTS) is a group of symptoms caused by irritation of the median nerve in the carpal tunnel. It is often idiopathic and frequently found in manual workers. It causes neuropathic pain that negatively affect the quality of life. The aim of this study was to compare the contribution of manual therapy versus neurodynamic techniques in the management of moderate idiopathic CTS.
Patients and methods: A prospective comparative study included patients with moderate CTS divided into group A: manual therapy and group B: neurodynamic techniques. The rehabilitation protocol was carried out over a 4-week period with 3 sessions per week. The evaluation was based the Visual Analog Scale (VAS) for pain and the BCTQ and Quick DASH functional scores.
Results: At the end of the protocol, both groups had an improvement in pain and functional scores with a superiority of the neurodynamic group for the pain score (VAS), the Quick DASH and the BCTQ-SSS score.
Conclusion: Manual therapy and neurodynamic techniques are effective on pain, functional signs in moderate idiopathic CTS but neurodynamic techniques showed superiority in this study on pain and functional scores.

P1348

SUSTAINED EFFICACY, SAFETY AND IMMUNOGENICITY FOLLOWING SINGLE SWITCH FROM REFERENCE DENOSUMAB TO FKS518 PROPOSED BIOSIMILAR IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS (RESULTS FROM THE PIVOTAL LUMIADE 3 STUDY)

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Background: Biosimilars reduce medication costs and improve access to treatments, making the transition from originator biologics to biosimilars of great interest. FKS518 is a candidate biosimilar to denosumab, a RANKL inhibitor, used in osteoporosis.

Objectives: The LUMIADE-3 phase study aimed to demonstrate therapeutic equivalence between FKS518 and reference denosumab (originator) in postmenopausal women with osteoporosis, and to evaluate the impact of transitioning from denosumab to FKS518 on efficacy, safety, and immunogenicity.

Material and Methods: This randomized, double-blind, multicenter trial involved osteoporotic women aged 55-85 with LS-BMD T-scores between -2.5 and -4.0. Patients were randomized 1:1 to originator or FKS518 (60 mg doses, 1 every 6 months) until week 52 (W52, end of Core Period). At W52, those on originator were re-randomized 1:1 to continue or switch to FKS518, while those on FKS518 continued their treatment. The primary objective was to show equivalence in efficacy and pharmacodynamics[1]. Efficacy and safety endpoints at W52 and up to W78 included LS-BMD, BMD at femoral neck and total hip, occurrence of adverse events (AEs), serious AE, local tolerability, and immunogenicity.

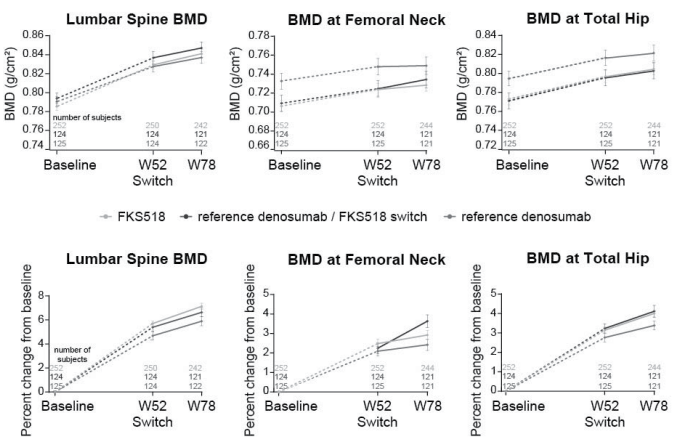
Results: A total of 553 patients were randomized to FKS518 (277) or originator (276). Therapeutic equivalence was demonstrated[1]. At W52, 125 patients on originator were re-randomized to continue and 124 to switch to FKS518. Clinically relevant increases in LS-BMD, femoral neck BMD, and total hip BMD were observed at W52 (Figure 1). Increases continued up to W78. At W78, changes from baseline in these BMD measures were similar between those who continued on originator and those who switched to FKS518. No clinically meaningful differences in safety, tolerability, or immunogenicity were observed after switching.

Conclusions: The study demonstrated therapeutic equivalence between FKS518 and the originator, with sustained efficacy and no impact on safety or immunogenicity after transitioning from the originator to FKS518.

References:

1. Sadek, J. et al., ASCO poster, 2024.

Figure 1: LS-BMD, BMD at femoral neck and total hip by DXA over time in patients receiving FKS518, reference denosumab and patients who transitioned from reference denosumab to FKS518 at W52 (ITT Analysis set)



Data, mean; bars, standard error of the mean;
BMD, bone mineral density; DXA, dual energy X-ray absorptiometry; ITT, intention-to-treat.

P1349

A RANDOMIZED, CONTROLLED, MULTICENTER STUDY TO EVALUATE THE THERAPEUTIC EQUIVALENCE BETWEEN FKS518 PROPOSED BIOSIMILAR TO DENOSUMAB AND THE REFERENCE DENOSUMAB IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS (LUMIADE-3 STUDY)

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Background

Treatment with denosumab, a RANKL inhibitor, is growing with patient ageing, and biosimilars can increase patients' access to treatment. FKS518 is a candidate biosimilar to denosumab. LUMIADE-3 study (NCT04934072) was designed to assess the safety and efficacy of FKS518 and evaluate its therapeutic equivalence to the reference denosumab (originator).

Material and Methods

This randomized, double-blind, multicenter trial involved postmenopausal osteoporotic women aged 55-85 with LS-BMD T-scores between -2.5 and -4.0. Patients were randomized 1:1 to the originator or FKS518 (60 mg doses, 1 every 6 months) until week 52 (end of Core Period). The primary objective of the study was to show equivalence in efficacy (percentage change from baseline (%CfB) in LS-BMD at W52) and pharmacodynamics (PD, Area under the effect curve (AUEC) of serum C-terminal cross-linking telopeptide of type 1 collagen (CTX) up to W26). An analysis of covariance model was used to compare the two treatments.

Results

A total of 553 patients were randomized to FKS518 (277) or the originator (276). Clinically relevant increases in LS-BMD were evident at week 52 in both treatment groups (Figure 1). Efficacy and PD equivalence were demonstrated since the 95% CI of the treatment difference for %CfB in LS-BMD at W52 ([0.04%, 1.29%]) laid entirely within the pre-defined equivalence margin [-1.45%; +1.45%] and the 95% CI of the ratio of means for AUEC0-26 CTX ([0.99,1.04] ng*h/L) was entirely within [0.89; 1.12] ng*h/L. No clinically meaningful differences in safety, tolerability, or immunogenicity were observed between treatment groups: 185 (66.8%) patients in the FKS518 group experienced treatment emergent adverse events during the 52 weeks core period and 189 (68.5%) in the originator product group. The number of patients with anti-drug antibodies remained low (1.1% ADA positive in FKS518 and 2.2% in originator group).

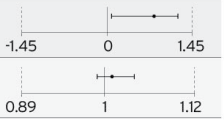
Conclusion

The study demonstrated the therapeutic equivalence of FKS518 with the originator and showed similar safety and immunogenici-

ty profiles between the two products.

Figure 1: Primary efficacy and pharmacodynamic endpoints

	FKS518 n=277	Reference n=276	FKS518 vs. reference *
%CfB in LS-BMD at week 52	5.74 (5.12, 6.35)	5.07 (4.44, 5.70)	0.66 (0.04, 1.29)
AUEC (0-W26) in CTX	1895 (1849, 1941)	1875 (1828, 1923)	1.01 (0.99, 1.04)



Numbers represent least squares mean and 95% confidence interval. Dashed lines indicate pre-defined equivalence margins. Population: ITT Analysis set.
*For %CfB in LS-BMD at week 52, difference in least squares mean is displayed. For AUEC(0-W26) CTX, ratio of geometric least square means is presented.
Abbreviations: AUEC(0-W26) = area under the effect curve from time 0 to Week 26; %CfB = percent change from baseline; LS-BMD = bone mineral density assessed by DXA; ITT = Intention-to-Treat; CTX = serum C-terminal cross-linking telopeptide of type 1 collagen; n = number of subjects included in the analysis.

P1350

PATIENTS PROFILE AND EFFECTIVENESS OF ROMOSOZUMAB IN REAL-LIFE: A PROSPECTIVE MULTICENTER STUDY IN SWITZERLAND

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Objective: Romosozumab (Romo) is a monoclonal antibody against sclerostin with dual antiresorptive and anabolic effects. This study aimed to determine patients' profile receiving Romo and evaluate effectiveness of one-year treatment in high-risk osteoporosis patients, in routine clinical practice.
Methods: This prospective study was conducted in five osteoporosis centers in Switzerland among patients who initiated 12 months of treatment with Romo (210 mg subcutaneously monthly) since 2021. The primary outcome was bone mineral density (BMD) changes from baseline to 12 months at lumbar spine (LS), total hip (TH), and femoral neck (FN). Data on bone turnover markers (BTM), carboxy terminal telopeptide of collagen type I (CTX) and procollagen type 1 N-terminal propeptide (P1NP) were also collected.
Results: A total of 340 patients (89.7% female) with mean (±SD) age of 70.4 (±10.3) years were enrolled in this study. Among them, 48.8% were treatment-naïve while 22.9% switched from bisphosphonate or denosumab to Romo and 28.2% received osteoporosis treatment in the past. At Romo initiation, 71.2% had experienced multiple major osteoporotic fracture, 78.5% a recent fracture, and a T-Score ≤ -3.5 was found in half of the patients. In patients who completed the 12-dose course of Romo treatment (86.9%) the median BMD percentage changes from baseline to 12 months were 12.9% at LS, 3.0% at TH, and 3.1% at FN. In patients who discontinued Romo before 12 months (median exposure of 5 months; range 1-11), comparable BMD gains to 12 months completers were observed at LS and FN at month 12, but BMD gains at total hip were lower. BMD gains were significantly higher at all sites in treatment-naïve patients compared to the group previously exposed to anti-resorptives.
Conclusion: This real-world data in a population of Swiss patients contributed to the growing body of evidence that Romo treatment for 12 months substantially increased BMD at LS, FN, and TH in patients at high fracture risk. The increase in BMD was attenuated in patients switching from antiresorptive therapy to Romo compared to treatment-naïve patients, and potentially at the hip in those interrupting treatment prematurely.
Acknowledgement: This study was sponsored by UCB Pharma.

P1351

CARDIOVASCULAR EVENTS IN PATIENTS TREATED WITH ROMOSOZUMAB AND OTHER ANTI-OSTEOPOROTIC AGENTS: A COMPARATIVE ANALYSIS USING REAL-WORLD DATA

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Introduction
Romosozumab (RMZ) is a recently approved agent with proven efficacy in treating Osteoporosis. However, its use has been associated with increased cardiovascular (CV) events. This study uses real-world data to describe and compare the occurrence of CV events among patients treated with RMZ and other anti-osteoporotic agents.
Methods and Materials
Retrospective study of EudraVigilance reports on CV events associated with RMZ, bisphosphonates (BP), and denosumab (DN) from January 2020 to December 2024. Reports by non-healthcare professionals, duplicates, or possibly related to more than one anti-osteoporotic treatment were eliminated. Demographics, events' outcomes, severity criteria, and associated actions were analyzed descriptively. Comparative analysis was performed to evaluate differences across treatments, stratifying by age, sex, event type, outcome, severity criteria, event duration, treatment indication, and approach. Reporting Odds Ratio (ROR) was calculated for RMZ compared to the other treatment groups.
Results
Healthcare professionals reported 33,348 suspect adverse reactions (SARs) in the EudraVigilance database (5,722 RMZ-, 12,246 BP-, and 15,380 DN-related SARs). Of these, 84 CV events were reported for RMZ, 8 for BP, and 10 for DN (Table 1).
The majority of CV SARs involved females aged 65-85 Years. All CV SARs were associated with at least one severity criteria, and the most reported was the presence of other important medical conditions (78.57% of RMZ -, 50% of BP-, and 90% of DN-related SARs), such as the presence of neoplasia. RMZ was stopped in all cases with available data except one. No significant differences were observed among the treatments regarding event type, outcomes, age or sex distribution, severity criteria, or event duration. Romosozumab was associated with a significantly higher risk of

CV SARs [ROR 22.85, CI (13.72-38.05)].

Conclusion

Our EudraVigilance data analysis revealed that RMZ was associated with a substantially increased risk of CV events (1.47% of all SARs). These findings highlight the need to address this safety issue and consider CV risks in Osteoporosis management. Ensuring the accurate reporting of SARs is essential to enhance the reliability of real-world data, ultimately supporting better-informed decisions in clinical practice.

Table 1. Sociodemographic and clinical data

	Romosozumab	Biphosphonates	Denosumab
Sex - N (%) ¨			
Female	67 (81.70)	5 (71.43)	10 (100)
Male	15 (18.30)	2 (28.57)	0 0.00
Age Group - N (%)^			
18-64 years	13 (16.88)	2 (33.33)	1 (11.11)
65–85 years	55 (71.43)	3 (50.00)	8 (88.89)
Older than 85 years	9 (11.69)	1(16.67)	0 0.00
Primary Source Country, Non European Economic Area - Treatment indication,- N (%) *	77 (91.67)	5 (62.50)	3 (30.00)
Osteoporosis	73 (100)	4 (80.00)	2 (66.67)
Bone Lesions	0 (0.00)	1 (20.00)	1 (33.33)
Treatment duration, days - Mean ± SD	32.8±60.72	16.00±6.00	5.50±0.50
Type of Suspected adverse event - N (%)			
Acute myocardial infarction	50 (59.82)	4 (50.00)	5 (50.00)
Cerebrovascular Accident	34 (40.48)	4 (50.00)	5 (50.00)
Reaction outcome at time of report - N (%)**			
Recovered/resolved	29 (45.31)	1(16.67)	4 (66.67)
Recovering/resolving	13 (20.31)	2 (33.33)	0 (0.00)
Recovered with sequelae	1 (1.56)	0 (0.00)	0 (0.00)
Not recovered/not resolved	11 (17.19)	0 (0.00)	0 (0.00)
Fatal	9 (14.06)	3 (50.00)	2 (33.33)
Seriousness criteria - n (%)			
Caused/prolonged hospitalization	52 (61.90)	6 (75.00)	2 (20.00)
Disabling	3 (3.57)	0 (0.00)	0 (0.00)
Life Threatening	14 (16.67)	3 (37.50)	0 (0.00)
Other medically important condition	66 (78.57)	4 (50.00)	9 (90.00)
Resulted in death	9 (10.71)	3 (37.50)	2 (20.00)
Action taken - N (%) ˆ			
Treatment withdraw	52 (98.11)	0 (0.00)	0 (0.00)
Treatment unchanged	1 81.89)	0 (0.00)	1 (100.00)
TOTAL	84	8	10

¨ of 82,7, and 5 with available data for romosozumab, bisphosphonates, and denosumab, respectively
^of 73, 8, and 5 with available data for romosozumab, bisphosphonates, and denosumab, respectively
**of 64,6, and 6 with available data for romosozumab, bisphosphonates, and denosumab, respectively
* of 77, 6, and 9 with available data for romosozumab, bisphosphonates, and denosumab, respectively
ˆ of 53, 0, and 1 with available data for romosozumab, bisphosphonates, and denosumab, respectively

P1352

A COMPARATIVE COHORT STUDY ON PARAFFIN THERAPY IN OSTEOARTHRITIS AND RHEUMATOID ARTHRITIS

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Purpose (the aim of the study): Osteoarthritis (OA) and rheumatoid arthritis (RA) are common rheumatic conditions characterized by joint pain and inflammation. Paraffin therapy has emerged as a potential adjunctive treatment, but its comparative effectiveness in OA and RA remains unclear. This study aims to assess the clinical characteristics, pain scores, and joint parameters in patients with OA and RA undergoing paraffin therapy, providing insights into the differential treatment responses between the two conditions.

Methods: A cohort of 64 OA and 68 RA patients was recruited, and clinical characteristics such as age, sex, BMI, duration of diagnosis, hand nodules, smoking history, and medication use were recorded. Pain scores (Visual Analog Scale) at rest and with activity were assessed at the beginning, after 4 weeks, and after 12 weeks of paraffin therapy. Joint counts for painful, tender, and swelling joints were also documented at these time points.

Results: Clinical characteristics revealed subtle differences between OA and RA groups, with RA patients exhibiting a higher prevalence of hand nodules and concurrent medication use. Pain scores at rest and with activity showed no significant differences between OA and RA groups at the beginning, after 4 weeks, and after 12 weeks. Joint counts demonstrated comparable numbers of painful and tender joints, with a significant reduction in swelling joints after 4 and 12 weeks in OA patients.

Conclusions: Paraffin therapy appears to have a similar impact on pain scores in OA and RA patients, suggesting comparable treatment responses. While both groups exhibit a reduction in swelling joints, the significant decrease observed in OA patients implies a potentially more pronounced anti-inflammatory effect in this group.

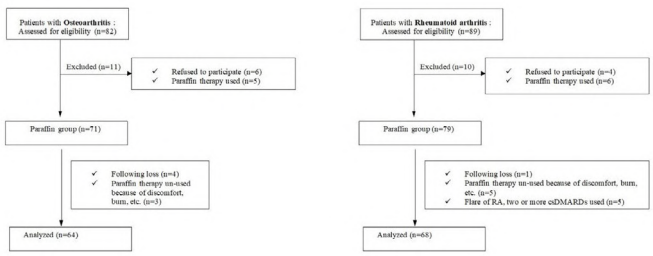

Figure 1. Flowchart of patients

Table 1. Clinical characteristics of the patients with osteoarthritis versus patients with rheumatoid

Clinical characteristics	Osteoarthritis (n=64)	Rheumatoid arthritis (n=68)
Age, years, mean (SD)	59.08 (10.29)	56.23 (9.23)
Female sex, n (%)	47 (73.4%)	56 (82.3%)
BMI (kg/m2), mean (SD)	22.83 (3.35)	21.51 (2.98)
Duration of diagnosis, years, mean (SD)	1.09 (0.32)	0.87 (0.29)
Hand nodule, n (%)	23 (35.9%)	21 (30.9%)
Smoking, n (%)	19 (29.6%)	17 (25%)
Medication, n (%)		
NSAIDs	51 (79.6%)	53 (77.9%)
Acetaminophen	51 (79.6%)	12 (17.6%)
Corticosteroid	1 (1.6%)	9 (13.2%)
Conventional DMARDs		59 (86.7%)

BMI: body mass index; NSAIDs: nonsteroidal anti-inflammatory drug DMARDs: Disease-modifying antirheumatic drugs.

Table 2. Number of painful, tender, and swelling joints in patients with osteoarthritis versus patients with rheumatoid arthritis

Joint Count	Osteoarthritis (n=64)	Rheumatoid arthritis (n=68)	p-value
Painful joint			
Beginning	7.00 (4.00-9.00)	8.00 (6.00-10.00)	0.696
After 4 weeks	5.00 (3.00-7.00)	7.00 (5.00-9.00)	0.271
After 12 weeks	5.00 (2.00-7.00)	5.00 (3.00-7.00)	0.422
Tender joint			
Beginning	5.00 (4.00-7.00)	7.00 (4.00-10.00)	0.398
After 4 weeks	3.00 (2.00-5.00)	5.00 (4.00-6.00)	0.195
After 12 weeks	2.00 (1.00-4.00)	4.00 (3.00-6.00)	0.081
Swelling joint			
Beginning	3.00 (2.00-7.00)	6.00 (4.00-8.00)	0.203
After 4 weeks	1.00 (0.00-3.00)	5.00 (3.00-8.00)	0.045
After 12 weeks	0.00 (0.00-1.00)	4.00 (2.00-7.00)	0.039

P1353

THE ROLE OF LOW-GRADE INFLAMMATION IN THE PATHOGENESIS OF OSTEOARTHRITIS

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Low-grade inflammation is increasingly considered a key factor in the pathogenesis of osteoarthritis and is viewed as a potential therapeutic target. We conducted a study measuring complement fractions (C3 and C4) in blood plasma and synovial fluid. The aim of the study was to establish the involvement of humoral factors of the innate immune response in the disease's pathogenesis. We sought correlations between plasma and synovial levels of C3 and C4 – complement fractions – and aimed to determine the difference in the expression of C3 and C4 in two fractions of synovial fluid: supernatant (A) and sediment (B).

Our results showed that the mean percentage of C3 levels in synovial fluid compared to plasma levels for the sample was 34.90%. The mean percentage of synovial C4 levels compared to plasma levels was 30.97%. The difference in C3 values between cell-bound (fraction B) and soluble (fraction A) fractions in the overall population was positive, meaning that C3 levels in synovial fluid fraction B were higher than those in synovial fluid fraction A. We found that C4 levels in both fractions of synovial fluid, similar to the results for C3, were higher at earlier radiographic stages compared to advanced stages of the disease.

The results confirmed the role of complement in maintaining low-grade inflammation, as well as in clearing the joint space of degenerative and apoptotic products resulting from joint destruction in osteoarthritis.

P1354

VITAMIN D LEVELS IN PREGNANT WOMEN WITH HYPOTHYROIDISM, GESTATIONAL DIABETES, DIABETES MELLITUS AND AFTER BARIATRIC SURGERY

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Introduction: Pregnancy challenges bone metabolism due to an increased mineral demand caused by the growing fetus. Bone resorption is increased while bone formation is decreased. Insufficient intake of calcium and vitamin D are risk factors for pregnancy associated osteoporosis and for development of osteoporosis in later life. Diabetes mellitus as well as bariatric surgery are associated with lower levels of vitamin D and may indicate an increased risk for osteoporosis. Therefore, we determined 25-OH-vitamin D levels in pregnant women with gestational diabetes or pe-existing diabetes mellitus, in women pregnant after bariatric surgery and in pregnant patients with substituted hypothyroidism (controls).

Methods: Patients presented for endocrinological prenatal care in our practice. Blood samples were obtained during routine work-ups. Serum aliquots were stored at -20 Celsius for 25-OH-vitamin D and P1NP (procollagen-Type- 1-N-terminal propeptide) measurements (automated analyses, Roche Cobas).

Results: 25-OH-Vitamin D levels were 105 ± 41 nM (hypothyroidism), 92 ± 29 nM (gestational diabetes), 80 ± 20 nM (pre-existing diabetes mellitus), 98 ± 27 nM (after bariatric surgery). P1NP-levels were 64 ± 34 ng/ml (hypothyroidism), 53 ± 25 ng/ml (gestational diabetes), 36 ± 20 ng/ml (pe-existing diabetes mellitus), 44 ± 22 ng/ml (after bariatric surgery). No significant differences were found in vitamin D-levels. Bone formation marker P1NP was significantly lower in pregnant patients with pe-existing diabetes mellitus ($p = 0.03$) as well as in women pregnant after bariatric surgery ($p=0.03$) compared to pregnant patients with substituted hypothyroidism. Serum calcium levels were lowered in women pregnant after bariatric surgery (2.25 ± 0.09 mM versus 2.30 ± 0.08 mM, $p = 0.04$).

Conclusion: Although only women pregnant after bariatric surgery were taking vitamin D supplements, there was no vitamin D deficiency in either group of pregnant women. Merely a trend to lower vitamin D concentrations was observed in pregnant patients with pe-existing diabetes mellitus. P1NP was lower in pregnant patients with pe-existing diabetes mellitus compared to controls, indicating an increased risk for osteoporosis.

P1355

OVEREXPRESSION OF INOSITOL-REQUIRING ENZYME-1 (IRE-1) INHIBITS CHONDROCYTE DIFFERENTIATION

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Inositol-requiring enzyme 1 (IRE1), an ER-transmembrane protein, is an essential component of the UPR pathway important for sensing and responding to ER stress. However, effect of IRE1 on chondrocytes differentiation has not been studied. Here, We investigated whether IRE1 regulates Type Ⅱ collagen, an indicator of differentiation of chondrocyte. IRE1 cDNA or IRE1 siRNA was transfected into rabbit chondrocytes. Western blot analysis, RT-PCR and immunofluorescence staining analyzed expression of type Ⅱ collagen. These results showed overexpression of IRE1 inhibits differentiation of chondrocytes, knockdown of IRE1 promote differentiation of chondrocytes. Furthermore, we determined whether IRE1-regulated chondrocyte differentiation occurs regardless of ER stress. Treatment of 2-Deoxy-D-glucose (2DG) on IRE1-transfected was assessed using western blot. 2DG-induced dedifferentiated was accelerates with IRE1 cDNA, attenuated with IRE1 siRNA. However, expression of glucose-regulated protein, GRP78, which is activated after ER stress has not been changed. The elucidation of these mechanisms indicates that IRE1 plays critical role in chondrocyte differentiation via ER stress-independent pathway.

P1356

THE RHEUMATOLOGICAL MANIFESTATIONS IN DIABETICS: FREQUENCY, CHARECTERISTICS AND ASSOCIATED FACTORS

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Introduction:
Diabetes is a challenging condition, primarily due to degenerative complications that increase morbidity and mortality. However, its rheumatological manifestations are rarely described in African literature, despite their functional impact. The objectives of our study were to describe the rheumatological manifestations in patients with diabetes mellitus and to identify the factors associated with their occurrence.
Methods:
We conducted a retrospective, descriptive study on diabetic patients followed at the Internal Medicine Department of the Hospital of the Internal Security Forces of Marsa, Tunis between February and June 2024. The data collected were epidemiological for each patient, followed by clinical and paraclinical information specific to diabetes, as well as to each rheumatological manifestation.
Results:
We collected data from 65 diabetic patients. The average age was 59.29 years, and the sex ratio was 0.72. Forty percent of the patients were smokers. Hypertension and dyslipidemia were present in 52% of the cases, and obesity in 39% of the cases.
Sixty-two patients (95%) had type II diabetes with an average duration of 15 years. Microangiopathies were common, including retinopathy (54%), peripheral neuropathy (35%), autonomic neuropathy (51%), and nephropathy (34%). Regarding macroangiopathies, 22% of the cases had myocardial infarction, 3% had a stroke, and 3% had peripheral artery disease.
In our study, 31% of the patients (n=20) presented musculoskeletal manifestations, distributed as follows: adhesive capsulitis (n=4), carpal tunnel syndrome (n=4), trigger finger (n=4), Dupuytren's disease (n=3), Forestier's disease (n=2), infectious spondylodiscitis (n=2), and osteoporosis (n=1).
The comparative study showed that female sex (p=0.05), age (p=0.029), smoking (p=0.032), the duration of diabetes (p=0.038), and microangiopathies—diabetic retinopathy (p<10-3), diabetic peripheral neuropathy (p<10-3), and diabetic autonomic neuropathy (p=0.048) were factors associated with the development of rheumatological manifestations in diabetes mellitus.
Conclusions:
Osteoarticular complications of diabetes are relatively common. A better understanding of the predictive factors in a multicentric study is needed to optimize a therapeutic strategy tailored to our population.

P1357

OSTEOARTHRITIS AND DIABETES MELLITUS: UNRAVELING THE CONNECTION

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Objectives:
Osteoarthritis (OA) is a common and disabling joint disorder, and recent studies have highlighted its strong association with type 2 diabetes. It is now recognized as a key contributor to the development and progression of OA, beyond its association with obesity and metabolic dysfunction.
The objectives of our study were to describe osteoarthritis in patients with diabetes mellitus and to identify the factors associated with their occurrence.
Material and Methods:
We conducted a retrospective, descriptive study on diabetic patients followed at the Internal Medicine Department of the Hospital of the Internal Security Forces of Marsa, Tunis between February and June 2024. The data collected were epidemiological for each patient than clinical, paraclinical, and therapeutic, specific to osteoarthritis as well as to diabetes.
Results:
We collected data from 65 diabetic patients: average age 59.29 years, sex ratio 0.72, 95% with type II diabetes, lasting 15 years on average.
Osteoarthritis was observed in 42% of patients (n=27), with a mean age of 62 years and a sex ratio of 0.42. The most common comorbidities were hypertension and dyslipidemia (100%), followed by obesity in 93% and overweight in 3%. All patients had type 2 diabetes for an average of 20 years with degenerative complications: retinopathy (62%), peripheral neuropathy (42%), autonomic neuropathy (65%), and nephropathy (40%). Regarding macroangiopathies, 30% had myocardial infarction.
Seventy-nine percent had knee osteoarthritis, 15% had hip osteoarthritis, and 4% had cervical osteoarthritis.
Radiologically, 58% of the patients were classified as having severe osteoarthritis, of which 42% underwent surgical intervention. The remaining patients received corticosteroid injections in combination with non-steroidal anti-inflammatory drugs and physical treatment.
The comparative study showed that female sex (p=0.038), age (p=0.03), the duration of diabetes (p=0.032), and microangiopathies—diabetic retinopathy (p<10-3), diabetic peripheral neuropathy (p<10-3), and diabetic autonomic neuropathy (p=0.044) were factors associated with the development of osteoarthritis.
Conclusions:
Chronic type 2 diabetes, especially during the stage of degenerative complications, is linked to the development and progression of osteoarthritis. This relationship may be driven by factors such as oxidative stress, pro-inflammatory cytokines, and the accu-

mulation of advanced glycation end products in joint tissues exposed to prolonged high glucose levels.

P1358

DOES TREAT-TO-TARGET THERAPY PREVENT BONE LOSS IN EARLY RHEUMATOID ARTHRITIS?

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Rheumatoid arthritis (RA) is a prototype of autoimmune disease that links the immune system and bone metabolism.
This study aimed to evaluate the association of disease activity with bone mineral density (BMD) changes in the context of T2T strategies in patients with early RA.
Material and Methods: Prospective study consists of 84 patients with early RA. The majority were female (65-77.38%). The average age of the examined group is 56.76±14.6 years. All patients were initially treated with MTX (average dose 17.68 mg per week) with occasional administration of small doses of glucocorticoids (Prednisolone in average dose 7.32±2.64 mg/day). After 6 months, the patients were divided into two groups (A and B). Group A consisted of patients in whom the therapeutic goal was achieved (low disease activity or remission - DAS 28 SE≤3.2) and they continued MTX monotherapy. Group B consisted of patients who, despite the use of MTX, had high or moderate disease activity (DAS 28 SE >3.2) and continued combined therapy (MTX and antimalarial or MTX and Salazopyrin).
BMD was measured on the Hologic device, both at the (LS) lumbal spine and at the femoral neck, at the time of RA diagnosis and one year later. The groups are homogenous according to the other risk factors for osteoporosis (menopausal and smoking status, age, BMI, use of vitamin D).
Results: The initial BMD values in the groups did not differ significantly. Patients who achieved remission or low activity (n = 38) had less yearly bone loss at the LS (1,75% vs 1,34%) and hip (1,45% vs 0,98%). After one year, a significantly greater number of patients from B group, showed a decrease in BMD (31.25% vs 7.69%) (p<0.05). A negative linear correlation between disease activity (DAS 28 SE) and the change of BMD in the LS and hip was found, indicating the key role of the T2T strategy in reducing bone loss (consecutively, r=-0.24, p< 0.05; r=-0.28, p<0.05).
Conclusion: Aggressive treatment of early RA, according to the T2T principle, significantly reduces the rate of bone loss after one year of therapy.
Key words: T2T therapy, rheumatoid arthritis, osteoporosis

P1359

SOCIO-ECONOMIC INEQUALITIES IN FALL AMONG IRANIAN ELDERLY HYPERTENSIVE POPULATION: A CONCENTRATION INDEX ANALYSIS

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Background: Falls are a common cause of injury in the elderly with hypertension, as high blood pressure is related to impaired balance and decreased muscle strength. This study explores the degree to which socio-economic inequalities influence the distribution of fall prevalence among elderly hypertensive individuals.
Methods: This research was a cross-sectional study of inequality in fall accidents among hypertensive elderly people, using a representative sample of 3,927 Iranians aged ≥ 60 years from the Iran 2021 STEPwise survey. We estimated the concentration index (CI) and measured socio-economic inequalities in fall accidents, stratifying the analysis by gender, urban/rural residence, and blood pressure control status. Analysis was estimated in STATA-14.
Results: The concentration index for individual elderly people was estimated at (CI=-0.1100, p = 0.010) indicating that there is inequality and falls are more common among individuals in lower socio-economic groups. In accordance to residency, concentration index was (CI=-0.1370, p = 0.005), and (CI=-0.0723, p=0.40), for urban and rural residents, respectively. The other hand, CI for men and women were (CI=-0.099, p= 0.185), and (CI=-0.093, p= 0.078), respectively. Moreover, the inequality of falls among elderly hypertensive patients with uncontrolled blood pressure was (CI=-0.110, p= 0.039), a little bit higher compared to those with controlled blood pressure (CI=-0.126, p= 0.09).
Conclusion: This study shows the neglected issue of falls among hypertensive elderly individuals, particularly those from vulnerable socio-economic groups, urban residents, and those with uncontrolled hypertension. The blood pressure control in fall prevention has a critical role. Since there is a significant impact of falls in elderly individuals with hypertension, it is essential to focus on targeted policies and healthcare strategies to address these disparities, reduce inequalities, and improve the well-being of these at-risk populations.
Keywords: Fall accident, Inequality, Concentration Index, Hypertension

P1360

MIR-335-5P IS A POTENTIAL BIOMARKER AND A THERAPEUTIC TARGET IN POSTMENOPAUSAL OSTEOPOROSIS

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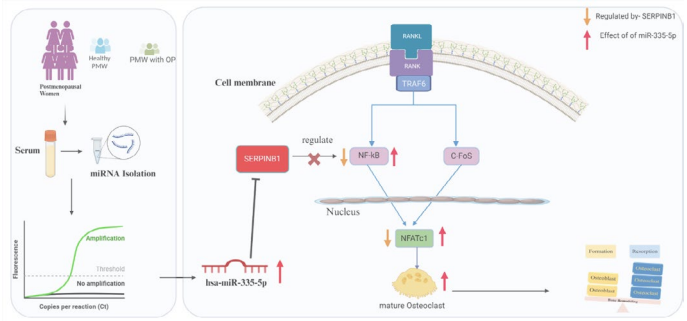
Objective: To investigate the role of hsa-miR-335-5p in postmenopausal osteoporosis (PMO), focusing on its regulatory relationship with SERPINB1, a negative regulator of osteoclast differentiation.

Materials and Methods: This study explored microRNA's role in postmenopausal osteoporosis (PMO) using microarray analysis. The microRNAs were validated via qPCR on 50 samples from PMO patients and 50 samples from healthy controls, where miR-335-5p was selected for further investigation. In silico analysis identified potential target genes, followed by functional validation in osteoblast-like cells (MG-63). *In-vivo* effects of miR-335-5p on osteoporotic rats were evaluated by assessing changes in target gene expression, microstructural analysis, and bone histomorphometry by transfecting corresponding antagomir.

Results: Microarray analysis revealed 262 differentially expressed miRNAs, where 232 upregulated and 30 downregulated. Eleven miRNAs exhibited fold change expressions between 7-10. Of these, three miRNAs were validated: miR-148a-5p, miR-335-5p, and miR-656-5p. Notably, hsa-miR-335-5p showed significant upregulation in osteoporotic patients (p = 0.0050). ROC analysis identified hsa-miR-335-5p as a superior biomarker with an Area Under the Curve (AUC) of 0.75. Bioinformatics analysis identified SERPINB1, a negative regulator of osteoclast activity, as a key target of hsa-miR-335-5p. Functional studies in MG-63 cells demonstrated that miR-335-5p overexpression significantly reduced both RNA and protein levels of SERPINB1 at 48 and 72 hours post-transfection, respectively, confirming SERPINB1 as a direct target of miR-335-5p. In vivo experiments involved transfection of miR-335-5p inhibitors in osteoporotic rats yielded compelling results. Increased SERPINB1 expression was observed in both plasma and bone marrow, correlating with notable changes in bone microstructure and histomorphometry. These findings provide strong evidence for the regulatory role of miR-335-5p in bone metabolism and its potential as a therapeutic target. **Conclusion:** This study demonstrates that hsa-miR-335-5p plays a critical role in PMO pathogenesis by targeting SERPINB1 and influencing osteoclast activity. These findings suggest that hsa-miR-335-5p could serve as both a biomarker and potential therapeutic target in the management of PMO.



P1361

SYSTEMATIC AND CRITICALLY-APPRAISED METHODOLOGIES FOR POSITION STATEMENT DEVELOPMENT IN OSTEOPOROSIS

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Objectives

Guidelines and position statements provide expert consensus, ensuring consistency in clinical practice and discourse. Best practice methodologies involve systematic approaches and quality appraisal to minimise bias. This study aimed to evaluate methodologies employed in osteoporosis position statements since the 2024 World Congress.

Materials and methods

A PubMed search was conducted using the terms “osteoporosis guidelines” and “osteoporosis position statements”, covering publications from 17th April 2024 to 24th January 2025. Manuscripts were excluded if they did not focus on osteoporosis, were not endorsed by an osteoporosis society, summarised existing guidelines, were living updates without a full revision, or represented primary research. A semi-quantitative descriptive analysis was performed.

Results

Fourteen guidelines and position statements were identified. Six (42.9%) utilised systematic review strategies, and the same proportion incorporated quality appraisal or evidence assessment. The most commonly used tool was the Grading of Recommendations, Assessment, Development and Evaluations (GRADE), applied in 28.6% of publications.

Conclusions

Osteoporosis guidelines and position statements are predominantly based on narrative and non-systematic expert opinions. Although some have adopted systematic methodologies and quality assessments aligned with study designs, this remains a minority practice.

P1362

A RARE CAUSE OF ULNAR NEURITIS - NOT AN EVERY DAY CASE

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Background

Ulnar neuritis is the second most common peripheral nerve disorder in the upper limb, after carpal tunnel syndrome. It is typically caused by nerve compression in the ulnar groove at the elbow. This study aims to present an unusual cause of ulnar neuritis that was confirmed through radiological and histological examination.

Case Presentation

A 69-year-old female patient presented to the orthopedic outpatient clinic with a palpable mass on the inner surface of the elbow and reported numbness along the distribution of the ulnar nerve. Clinical and electromyographic findings were consistent with ulnar neuritis. Plain radiological check showed calcium deposits in the ulnar groove region, raising suspicion of a uric acid tophus as a differential diagnosis. The patient had previously undergone unsuccessful conservative treatment, so surgical intervention was recommended.

During the surgical investigation of the ulnar nerve at the elbow, following the standard approach for ulnar neuritis, a large calcified mass was found in direct contact with the ulnar nerve while compressing it. The mass was removed, and a biopsy was sent to confirm clinical suspicions.

Clinical Outcomes

The biopsy revealed extensive deposits of weakly basophilic calcified material in the form of multiple foci separated by dense fibrous connective tissue. The patient reported an immediate postoperative relief from her symptoms and has remained fully healed since, with no recurrence in the affected joint or elsewhere

Discussion

Ulnar neuritis is a common upper limb condition, mostly due to anatomical variations in elbow structures.The ulnar nerve has several potential compression sites along its course. Although the elbow is the most common site of compression, the ulnar nerve is also susceptible to injury at the wrist, forearm, and upper arm. At the elbow, the ulnar nerve lacks protective cover in the ulnar groove. This causes its susceptibility to external compression. Repetitive elbow flexion and extension, arthritic changes, and valgus deformities at the elbow increase its vulnerability to injury. In some individuals, the ulnar nerve may be subluxed out of the retroepicondylar groove medially over the medial epicondyle during elbow flexion. This study presents an unusual mechanism of ulnar nerve compression (ectopic calcification) in the elbow that should be considered in the differential diagnosis of the etiology of ulnar neuritis. Although primarily confirmed by electromyography and clinical examination, radiological chech can sometimes reveal the underlying cause, facilitating effective treatment.

P1363

LEIOMYOMA OF THE INDEX FINGER - A RARE CASE

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Background

Leiomyoma is a rare benign tumor of nonstriated muscles. Its common elective localization is in uterus muscle, but it may involve the hand. Limb localization is rare, usually in the lower limbs. The purpose of this paper is to present a rare case of a tumor on the index finger in a young person, including the diagnostic, prognostic, and therapeutic approach, along with a literature review.

Case Presentation

A 17-year-old female patient came to the outpatient clinic complaining about a painful mass on her left index finger, accompanied by numbness in the affected finger. The mass was soft, mobile, and located subcutaneously. Initial imaging with plain X-rays showed no bone pathology, and an MRI was subsequently recommended. MRI imaging revealed a well-defined lesion with a signal intensity similar to soft tissues and a strong, slightly heterogeneous contrast enhancement). Surgical removal of the mass was planned, performed under local anesthesia with a tourniquet. The excised mass was sent for biopsy.

Clinical Outcomes

The biopsy results identified a degenerated leiomyoma, confirmed by immunohistochemical characteristics. The skin healed completely, and the numbness resolved within a few weeks. The patient retained full mobility in the index finger. No recurrence or other complications were observed up to the most recent examination, one year post-surgery.

Discussion

Leiomyoma is a benign tumor originating from smooth muscle fibers and is rarely found in the hand. Its most common location is in the uterus, and when it appears at the limbs, it is typically found around the ankle and foot. Leiomyoma is most often diagnosed in the third to fourth decades of life, with a definitive diagnosis made exclusively through histological examination following surgical excision. It should be considered in the differential diagnosis of subcutaneous tumors at the limbs, especially in cases of a single, slow-growing, painful nodule. The prognosis is excellent after a complete surgical excision with clear margins, with no risk of recurrence, and it requires no further treatment.

P1364

BRACHYDACTYLY OF THE 3RD, 4TH AND 5TH RAY OF THE HAND - A DIAGNOSTIC APPROACH

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Background

Brachydactyly ("short digits") is a general term that refers to disproportionately short fingers and toes, and forms part of the group of limb malformations characterized by bone dysostosis. The purpose of this study is to present the diagnostic approach to cases of brachydactyly.

Case Presentation

A 60-year-old female patient visited the outpatient clinic for an examination due to chronic lower back pain. During the clinical examination, it was observed that on both upper limbs, the 3rd, 4th, and 5th rays were notably shorter than the 2nd ray. Upon questioning, the patient reported no discomfort or functional issues, though she had noticed the deformity years prior. Her stature was short, but her facial features were normal. Imaging revealed shortened 3rd, 4th, and 5th metacarpals.

Clinical Outcomes

The patient declined further investigation into the causes of the brachydactyly.

Discussion

Brachydactyly (usually affecting the 4th and 5th rays) is a rare condition with causes that are categorized as follows:

Common Causes

Idiopathic brachydactyly
Post-inflammatory (e.g., osteomyelitis)
Pseudohypoparathyroidism (Type I and II, Albright's hereditary osteodystrophy [AHO]) / pseudopseudohypoparathyroidism
Post-traumatic (especially injuries affecting the epiphysis)
Turner Syndrome

Uncommon Causes

Gorlin Syndrome
Multiple exostoses syndrome
Juvenile idiopathic arthritis
Sickle cell disease
Homocystinuria
Langer-Giedion Syndrome

Investigation should include measurements of blood calcium, phosphorus, and parathyroid hormone, especially for metabolic diseases, along with a complete laboratory check and further imaging studies.

Brachydactyly is a rare condition that appears in a variety of cases, with metabolic disorders being “prominent” among them. Nowadays regarding to brachydactyly is less about treating functional issues and more about investigating and, if possible, treating its underlying cause. The clinical physician’s observational skills are crucial for detecting brachydactyly and possibly diagnosing related chromosomal abnormalities and metabolic disorders.

P1365

HALLUX VALGUS - MEDIUM TERM RESULTS OF CORRECTION WITH TIGHT ROPE

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Background

Hallux Valgus (HV) is a very common condition that is usually treated with a proximal or distal osteotomy of the first metatarsal. Despite the good correction achieved, these operations have complications such as malunion, pseudarthrosis, shortening of the 1st metatarsal, loosening of osteosynthesis, and osteonecrosis. Correction of the transmetatarsal angle with the use of a non-absorbable suture with a fixation button (tight rope by Arthrex) has also been used for the treatment of HV. This reduces the risks of corrective osteotomies while maintaining the reduction of the intermetatarsal angle (IMA).

Objectives

The purpose of this study was to evaluate the mid-term outcomes of patients who underwent HV correction through soft tissue correction and tight rope fixation.

Study Design & Methods

Over a period of 5 years, 42 patients underwent tight rope HV correction surgery in our clinic. Mean follow-up time was 25.4 months. IMA and Hallux valgus angle (HVA) were measured on radiographs preoperatively, immediately postoperatively, and at the last visit. Postoperative complications, and any additional operative procedures performed were also recorded.

It was very important for the fore foot to be supple enough so as the correction of the IMA was possible without major forces being exerted on the metatarsal.

All surgeries were performed by one of the 3 senior authors. First, an extensive medial release of the metatarsophalangeal joint complex was performed with an inverse L capsulotomy through a medial longitudinal incision, taking care to protect the dorsal medial cutaneous nerve. If necessary a bunionectomy or bony eminence exertion was performed. Through a second incision between the first and second metatarsal heads, the adductor tendon, intermetatarsal ligament, metatarsal-sesamoid ligament, and lateral joint capsule were completely released.

The suture button construct was then inserted.

An approximately 2-cm longitudinal incision was made between the second and third metatarsals. Distally, this incision began at the level of the proximal extent of the lateral release incision.

The lateral aspect of the second metatarsal shaft was exposed and a tunnel was performed with a 1,3 or 1,1 K-wire through the second metatarsal and then through the first metatarsal, exiting through the medial diaphysis just proximal to the first metatarsal head.

Results
All patients reported outcomes through scores were improved. The mean preoperative IMA and HVA were 17.9 and 30.6 degrees, respectively. The mean immediate postoperative IMA was 6.2 degrees and the mean HVA was 10.8 degrees. At final follow-up, mean IMA was 9.2 degrees and HVA was 15.7 degrees. The mean change in IMA was 16.0 degrees and the mean change in HVA from preoperative to final follow-up was 9.6 degrees.

Four patients experienced complications, including one intraoperative second metatarsal fracture, one postoperative second metatarsal fracture, and two superficial surgical wound infections.

Conclusions
The use of a soft tissue procedure combined with tight rope IMA correction is a safe and effective treatment of HV. Our results show that this technique can achieve correction of the IMA and HVA without the need for osteotomy.

P1366
BIPHALANGEAL TOES - A NORMAL AND NOT SO RARE VARIANT?

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Background
The presence of 2 phalanges in the 5th toe was first described by Leonardo da Vinci in 1492 and is recognized as a normal variant. It is probably a true anatomical variant resulting from incomplete segmentation rather than the result of phalangeal fusion.

Objectives
The purpose of this paper is to present a rare case of bilateral biphalageal 4th and 5th toe and discuss about the prevalence of biphalageal toes in the general population.

Study Design & Methods
A male patient came to the emergency department having a fore foot injury. Physical examination didn't reveal any restriction of movement of the toes or any bruising and swelling. X-ray examination showed no fracture in any bone of the foot. On the contrary, the existence of 2 phalanges in the 4th and 5th toes of both feet was discovered.

He never reported pain or any functional problems with toe movement, walking, or activities. All he mentioned is the similar morphology of the fingers in relatives of his.

He was subscribed with painkillers and given instructions not to walk for a few days and use ice therapy

Results
Looking at the literature, the prevalence of this anatomical variant in one study was for the 5th toe in 41.02% of the cases reported, for the 4th toe in 2.51%, for the 3rd toe in 0.20%, and for the 2nd toe in 0.12% of the cases. In another study the mean prevalence of biphalangealism in the 5th toe was 41.39%, in the 4th toe was 2.15%, and in the 3rd toe was 0.48%. In a third one biphalangeal toe in 0.5%, 1.7%, 3.5%, and 37.6% in the second, third, fourth, and fifth toe was observed, respectively. Unfortunately, in our hospital, due to poor data recording in the radiology department, it was not possible to record the prevalence in the population of our city. Also, no corresponding study of the Greek population was found. Knowledge of these variants is important to prevent misinterpreting them as fractures and malunions.

Conclusions
Biphalangeal fifth toe or more than one toe, is a common pedal anatomic variant seen approximately in one-third of the population. The reason for such evolution of the lateral toes is still debated, but the differences in anatomy most likely have no impact on foot function. A larger radiographic study in the Greek population to confirm the findings of this paper and investigate whether the trend is also being seen in other toes would however be of interest.

P1367
BLUE FINGER SYNDROME - MORE THAN MEETS THE EYE

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Background
Blue Finger Syndrome (BFS) is a benign and rare condition with an idiopathic aetiology. It is characterised by an acute bluish discoloration of fingers which may be accompanied by pain. The patients present with painless bluish discolouration of hands with sparing of finger tips and no changes in colour when subject to temperature changes. These features enable physicians to distinguish it from Raynaud's phenomenon.

Case Presentation
A 75-year-old female patient was admitted to the "suspected" COVID-19 clinic due to a respiratory infection. Her personal medical history included arterial hypertension and Raynaud's syndrome. She was being monitored solely for the respiratory infection. During her transfer to the pathological clinic, a change in color and impaired function of all fingers on both hands was observed, prompting a consult with the orthopedic team. The fingers showed signs of ischemia, so immediate decompressive incisions were performed, and anticoagulant and antiplatelet therapy was initiated. It was easily differentially diagnosed as having nothing to do with the known personal history of Raynaud's syndrome. Daily changes and needle decompression procedures were carried out until the necrotic areas were clearly defined.

Clinical Outcomes
After a few days there were no clear improvement and it was then decided to amputate the affected phalanges up to the boundaries of healthy tissue.The finger stumps healed without further complications, and the patient began physical and occupational therapy. Her finger mobility was sufficient for self-care.

Discussion
Blue finger syndrome (BFS), typically marked by a purple or blue discoloration of one or more fingers, can be the first symptom

of various diseases. These may directly affect the fingers or be systemic diseases. The most common causes include thrombosis, embolism, severe vasoconstriction, or vascular disruption that may be either inflammatory or non-inflammatory. Blue finger syndrome is relatively rare and can be attributed to numerous causes. Its significance lies in the fact that it is more than just a clinical sign; it often serves as a warning of underlying harmful diseases. Early diagnosis and treatment are essential to prevent comorbidities and, in some cases, mortality, as well as irreversible complications such as necrosis and/or amputation.

P1368

THE SIGNIFICANCE OF ERAP1 GENE POLYMORPHISMS AND ZINC IMBALANCE IN THE BODY OF PATIENTS WITH ANKYLOSING SPONDYLITIS

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Objective: To study the association of single nucleotide polymorphisms (SNPs) rs10050860 and rs17482078 of the ERAP1 gene and essential Zinc (Zn) imbalance with the clinical course of ankylosing spondylitis (AS).
Methods: A total of 58 patients (39 men and 19 women, average age 38 [31; 48] years) with a reliable clinical diagnosis of AS were examined. The median BASDAI index averaged 5.05 [3.6; 6.9] points, ASDASES – 3.1 [2.4; 4.1], MASES – 2 [0; 4], BASFI – 5.25 [3.1; 7.3]. HLA-B27 antigen was present in the overwhelming majority of patients – 91.37%. In addition to the generally accepted examination, all patients underwent genotyping of SNP rs10050860 and rs17482078 of the ERAP1 gene by the method of allele-specific hybridization in the format of polymerase chain reaction with fluorescence detection in real time using sets of primers on a detecting amplifier. The Zn content in hair was assessed by atomic adsorption spectrophotometry. The control group consisted of 14 relatively healthy individuals comparable to the main group by gender and age. Statistical processing of the obtained results was carried out using the STATISTICA 10 software package.
Results: In the course of our study, we found that the heterozygous [C/T] genotype of SNP rs10050860 of the ERAP1 gene was detected 1.6 times more often in patients with peripheral arthritis; $\chi2=4.82$, $p=0.029$, than in patients without this extra-axial manifestation. The obtained results were confirmed by factor analysis, according to which SNP rs10050860 of the ERAP1 gene made the greatest contribution to the development of extra-axial manifestations of AS - peripheral arthritis (0.16877), coxitis (0.20425), dactylitis (0.27602), extra-skeletal manifestations - uveitis (0.29707), Crohn's disease (0.17124) and a significant contribution to the value of the BASFI index (0.27308). The heterozygous [C/T] genotype of the SNP rs17482078 of the ERAP1 gene was 1.5 times more common in patients with peripheral arthritis, while the level of reliability was close to significant values; $\chi2 = 3.37$, $p = 0.067$, and, according to factor analysis, influenced the occurrence of peripheral arthritis (0.22494) and coxitis (0.18238), and was also associated with the development of uveitis (0.31885) and made a significant contribution to the value of the BASFI functional index (0.18709). An assessment of the microelement status showed that, compared with the control, in AS, a reliable decrease in the content of essential Zn by 41.32% was detected from 217.8 [163.8; 309] μg/g to 127.8 [100.5; 161.1] μg/g; $p=0.0002$. It is known that Zn deficiency in the body and a decrease in Zn intake into the Golgi apparatus leads to dysfunction of the ERp44 chaperone protein and an increase in the secretion of aminopeptidase 1 encoded by the SNP of the ERAP1 gene [Watanabe S., 2019], which plays one of the key roles in the pathogenesis of AS [Lee Y.H., 2011; Cortes A., 2015; Lee Y.H., 2016] and may affect the features of the clinical course of the disease. In this case, we found a reliable inverse correlation between the BASFI functional index and the Zn level in the hair of the studied patients with AS; $r = -0.299$, $p = 0.023$ and, according to factor analysis, Zn was associated with peripheral arthritis (0.10118) and contributed to the BASFI index (0.05011).
Conclusion: Thus, the carriage of heterozygous [C/T] genotypes of the rs10050860 and rs17482078 polymorphisms of the ERAP1 gene together with a deficiency of essential Zn in the body determine the functional state of patients with ankylosing spondylitis and are associated with the development of some extra-axial manifestations of the disease.

P1369

PREVALENCE AND FACTORS ASSOCIATED WITH FRAILTY AMONG HIP FRACTURE PATIENTS ADMITTED TO NATIONAL HOSPITAL, GALLE, SRI LANKA

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Introduction: Frailty is a common geriatric syndrome associated with the decline in health and bodily function and a leading cause of falls and fractures among older adults. This study assessed the prevalence and factors associated with pre-fracture frailty among hip fracture (HF) patients admitted to National Hospital, Galle, Sri Lanka.
Methods: A total of 209 consecutive patients with incident HF, aged 40 years or more were enrolled in this prospective cohort study. Pre-fracture frailty and sarcopenia were assessed soon after admission using the locally validated Frail Non-Disabled (FiND) questionnaire and SARC-F tool. Information related to health and physical function immediately before the fracture were also gathered. Chi square test and independent t- test were used to identify the associated factors.
Results: Among 209 subjects admitted between May 2023 and May 2024, 119 (72%) were females while 138 (71.8%) were mar-

ried. The mean age (SD) of HF patients was 73.8 (11.3) years. Of 209 patients, 107 (51.2%) were disabled before fracture. Of those non-disabled (n=102), 99 (97%) have been frail at the time of fracture. Among the patients with pre-fracture frailty, 29.7% were sarcopenic whereas 85.2% of those with pre-fracture sarcopenia (n=61) were frail. Female gender (p=0.006), living alone (p=0.003), low BMI (p<0.001), poor nutritional status (p=0.004), low Mini-mental score (p=0.02), poor pre-fracture mobility (p=0.024), and impaired activities of daily living (p=0.03) showed significant associations with pre-fracture frailty. Age and ASA scoring did not show significant associations with pre-fracture frailty.

Conclusion: We conclude that a considerable proportion of patients admitted with hip fracture were either physically disabled or frail at the time of fracture. This information can be used in recognizing those with a high fracture risk and these modifiable risk factors should be included in rehabilitation programs of older adults in the community.

Keywords: Associated factors, Frailty, Hip fracture, Prevalence

P1370

HOW TO PREVENT THE DEVELOPMENT OF GOUT?

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Objectives. To evaluate the effect of physical activity and nutrition on the frequency of gout attacks.

Materials and methods. The study was conducted in Turkmenistan from December 2021 to December 2023. The participants were 90 patients with gout who had a history of the disease for more than 5 years. The average age was 52.2 ± 2.9 years (62 men and 28 women). The patients were divided into two groups: experimental and control, with 45 people each. The experimental group visited the pool twice a week for 40 minutes and did physical therapy with gym poles once a week for 30 minutes, and also followed a diet of up to 1800 kcal/day. The control group led a normal lifestyle. To evaluate the results, a questionnaire was conducted, which focused on the frequency of gout attacks. The questionnaire contained the following questions:

1. Have you had a gout attack in the last two years? (yes/no)
2. Have you had a gout attack in the last year? (yes/no)
3. Was there any deterioration during the course of the disease (seizures became more frequent)? (yes/no)

The results were processed in Statistical Analysis Software17.0. Statistical significance was processed using Analysis of Variance analysis

Results. In the experimental group, 31 patients (69%) had not experienced gout attacks in the last two years, 13 patients (29%) had not experienced attacks in the last year, and only 1 (2%) noted a worsening. In the control group, 42 patients (93%) reported an increased frequency of seizures, while only 3 patients (7%) indicated no seizures over the past year.

Conclusion. Preventing the development of gout is associated with lifestyle changes such as going to the pool, exercising, and following a diet of up to 1800 kcal/day. As a result, 69% of the patients in the experimental group had not experienced gout attacks in the last two years.

P1371

INVESTIGATING THE PROTECTIVE EFFECT OF OLEANOLIC ACID IN OSTEOPOROSIS THROUGH NETWORK PHARMACOLOGY AND MOLECULAR DOCKING AND INTESTINAL FLORA

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Objective: Oleanolic acid is a pentacyclic triterpenoid extracted from Olea, which has a strong anti osteoporosis effect. This study aimed to investigate the potential mechanism of oleanolic acid on bone loss caused by estrogen deficiency through the combination of network pharmacology, molecular docking and in vivo validation.

Methods: we first predicted the drug target and structural interaction between oleanolic acid and osteoclasts on postmenopausal osteoporosis (PMOP) by network pharmacology and molecular docking. An ovariectomized (OVX) mouse model was established to experimentally verify the anti PMOP efficacy of oleanolic acid, which was supported by its protective effect on bone destruction and excessive inflammatory cytokines.

Results: the top 10 core targets of oleanolic acid produced by PPI network were ALB, PPARG, AKT1, ESR1, CASP3, IGF1, MMP9, EGFR, hsp90aa1 and Src. The enrichment results of go and KEGG pathways suggest that OA may participate in the regulation of OP through MAPK, PI3K Akt, estrogen and other signaling pathways. Molecular docking results showed that oleanolic acid had a strong binding force with the core target, and the binding energy was about -6.29 to -10.61kcal/mol. OA could significantly increase BMD and bv/tv of femur in OVX mice, and significantly reduce tb The contents of SP and serum Tracp5b, β -ctx and p1np suggested that OA could increase bone mass, inhibit bone resorption, promote bone formation, reduce bone turnover, and delay bone loss in OVX mice.

Conclusion: In conclusion, this study combined network pharmacology and molecular docking to predict the potential mechanism of oleanolic acid against PMOP. Through in vivo mouse model verification, oleanolic acid alleviates OVX induced bone loss by inhibiting inflammation.

Keywords : Oleanolic acid, Postmenopausal osteoporosis, Network pharmacology, Molecular docking, Inflammatory cytokines

P1372

THIGH MUSCLE QUALITY PREDICTS INCIDENCE OF TYPE 2 DIABETES

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Background
Ectopic fat infiltration in muscle tissue, particularly in the thigh, has been linked to metabolic dysfunction and may contribute to diabetes risk.
Objective
To investigate the association between low-density muscle (LDM) area at the midthigh level and the risk of incident diabetes in individuals without diabetes at baseline.
Methods
In this prospective study, 2,137 East Asian individuals (mean age 57.4 ± 16.9 years and BMI 25.0 ± 3.9 kg/m2, male 48.3%) with one or more cardiometabolic risk factors but no diabetes were enrolled. A non-contrast cross-sectional scan at the midthigh level was obtained, and areas ranging 0–30 Hounsfield units were defined as LDM.
Results
During a mean follow-up of 7.4 years, 201 males (19.5%) and 156 females (14.1%) developed diabetes. Participants who progressed to diabetes had higher baseline HbA1c than those did not (6.1 ± 0.3% vs. 5.7 ± 0.4%) and larger LDM areas (48.8 ± 14.2 cm2 vs 38.1 ± 13.2 cm2) (Both P < 0.05). A large LDM area was a significant predictor for incident diabetes (HR 2.36, 95% CI 1.52–3.67 for males; HR 2.15, 95% CI 1.28–3.61 for females) in the fully adjusted model including traditional risk factors including baseline HbA1c. Adding LDM area to traditional risk factors improved the predictive ability for diabetes progression, from 0.810 to 0.838 for males and from 0.893 to 0.908 for females in the area under the receive operating characteristic curve.
Conclusions
This study suggests that a large LDM area, indicating fat accumulation in muscle or muscle quality, is an important predictor for development of diabetes, necessitating interventions targeting muscle quality improvement and reducing fat accumulation.

P1373

OSTEOPOROSIS MANAGEMENT AMONG PATIENTS SCREENED THROUGH THE FRACTURE LIAISON SERVICE IN ONTARIO, CANADA

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Objectives: Describe osteoporosis management in patients screened through a Canadian provincial Fracture Liaison Service (FLS).
Material and Methods: We linked patients aged 50+ years screened through the Ontario FLS between 2017/04 and 2021/03 to provincial healthcare administrative data at ICES. Inpatient, emergency department and outpatient services were captured for all residents to identify fractures and DXA testing. Drugs dispensed in community pharmacies were available for persons aged 65+ years to identify osteoporosis treatment. Patients presenting with a hip, humerus, radius/ulna or pelvis fracture were eligible. We defined osteoporosis management using the Kaplan-Meier estimator over one-year post-fracture as: DXA testing (radius/ulna only; stratified by 1-year DXA history), and treatment initiation (ages 66+ years; stratified by 1-year treatment history). Patients were followed until date of death, entry into long-term care or 365 days. Results were summarized overall and by sex.
Results: Of 20,914 eligible patients, 20,237 (97%) were successfully linked (4,656 hip, 4,709 humerus, 10,545 radius/ulna, 327 pelvis); 83% female; median age=71, IQR=18; 76% treatment naïve and 13% with DXA history. Almost 70% of DXA-naïve patients with radius/ulna fracture received DXA during follow-up (70% female, 60% male; median time=97 days). At least 90% of patients with treatment history, regardless of fracture site or sex, were dispensed pharmacotherapy post-fracture. Among treatment-naïve patients; half with hip fracture (53%; 55% female, 49% male), and a third with humerus (35%; 37% female, 25% male) or radius/ulna (36%; 39% female, 18% male) fractures started pharmacotherapy.
Conclusions: Over 97% of Ontario FLS patients were successfully linked to provincial healthcare administrative data. ~70% radius/ulna fracture patients receive DXA for the first time, 90+% continued or restarted pharmacotherapy post-fracture, and more than half of treatment-naïve hip fracture patients initiate pharmacotherapy. However, some sex-differences in post-fracture management may exist.
Disclosures: This research was supported by the Ontario Ministry of Health. Authors report no conflicts of interest.

P1374

REAL-WORLD DIFFERENCES IN DENOSUMAB PERSISTENCE, REINITIATION, AND SWITCHING AMONG COHORTS OF OLDER ADULTS IN CANADA AND THE UNITED STATES

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Objectives: Describe initial persistence with denosumab, treatment reinitiation following an extended gap, and switching to other osteoporosis therapies in two comparison cohorts.
Material and Methods: We completed two parallel cohort studies leveraging: 1) healthcare administrative data from Ontario, Canada (ON; 100% population); and 2) a 20% random sample of US Medicare beneficiaries (US). The first denosumab claim (US: 1/2010-12/2019; ON: 1/2012-12/2021) was identified using pharmacy claims (ON) and Medicare Parts D and B claims (US). Patients aged <66 years, residing in long-term care (LTC), or with implausible data (e.g., death before first claim) were excluded. We developed and applied an algorithm that used a combination of dosing and days between dispensations to clean denosumab exposure data. We imputed a 183 day coverage for each denosumab dispensation and defined discontinuation as a 60-day gap in coverage. We estimated initial persistence, reinitiation, and switching to other osteoporosis medications using Kaplan-Meier estimators, censoring on death, disenrollment (US only), LTC admission, or study end (12/31/2022 [ON], 12/31/2020 [US]).
Results: We identified 168,339 adults in ON (mean age=78 [SD=7.6] years; 90% female) and 97,595 in the US (mean age=77 [SD=7.2] years; 90% female). In ON, the median length of initial persistence was longer (median 2.3 years [ON] vs. 1.7 years [US]), the proportion persiting with therapy for 3-years was higher (44% [ON] vs. 31% [US]), and time to reinitiate was shorter (median=0.5 years [ON] vs. 1.9 years [US]). About 10% of patients in each cohort switched to another osteoporosis medication during follow-up. Those with prior oral bisphosphonate use had longer durations of denosumab treatment in ON but not the US.
Conclusions: Older adults in Ontario have longer persistence and shorter gaps in denosumab use than those in the US. Research to understand reasons for differences in exposure patterns, and subsequent potential differences in treatment effectiveness and safety is important.
Disclosures: This research was supported by the National Institutes of Health Research Grant R01AG078759. Authors report no conflicts of interest.

P1375

OSTEITIS FIBROSA CYSTICA: ANALYSIS & VISUALIZATION OF THE RESEARCH ACTIVITIES

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Background and purpose: Osteitis fibrosa cystica is a serious medical condition caused by hyperparathyroidism. In this study, we aim to analyze all the publications produced in this field and present the view of knowledge in this field.
Methods: By searching the subject heading "Osteitis Fibrosa Cystica" in MESH database and retrieving all of the documents indexed in PubMed/Medline until 27 August 2024, 1665 documents from 772 resources were retrieved. The documents were analyzed using the R bibliometrix package 4.1.1. The networks were mapped and the most active authors, centers, and characteristics of the journals were determined.
Results: The retrieved documents were from 1946 to 2024 and most were published in 1965 (n=81). "Oral Surgery, Oral Medicine, Oral Pathology" and "Revue Du Rhumatisme Et Des Maladies Osteo-Articulaires" equally, had the most published articles in this field (n=21). USA (n=71), Turkey(n=46), India (n=45), China (n=44), and Brazil (n=38) were the most active countries in this area, respectively. Also, the "Post Graduate Institute of Medical Education and Research" and "Santa Croce and Carle Hospital" were the most productive institutions. "Ellisa HA" from Germany was the most prolific author of these articles, with 16 articles in this field. Fluorodeoxyglucose f18, positron emission tomography computed tomography, and parathyroid hormone were the most topic trends in recent years.
Conclusion: In the 50s and 60s, the publication of documents in this field was significant and more than ever before. In recent years, especially the last 3 years, there have been very few studies, and Asian countries have been the most active countries in this field after the USA. This issue may be attributed to earlier diagnosis through routine calcium checks and improved management of hyperparathyroidism. As a result, Osteitis fibrosa cystica has become quite rare in recent times. Further studies in the field are suggested.
Keywords: Osteitis Fibrosa Cystica, Scientometric Analysis, Bibliometric Analysis

P1376

DRAMATIC OUTCOME OF A CASE OF GORHAM-STOUT SYNDROME WITH CHYLOTHORAX AND MULTIPLE BONE DESTRUCTION

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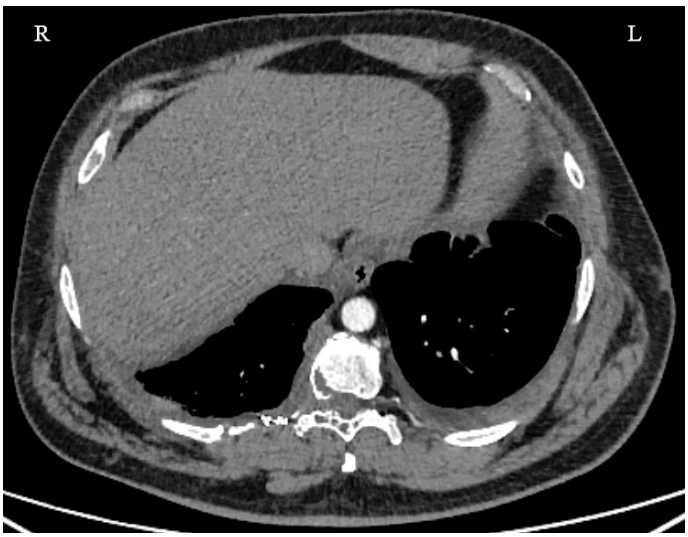
Objective. Our goal is to present a case of Gorham-Stout syndrome with chylothorax and multiple bone destruction in a man who was observed for three years until his death in 2024.
Methods. A 48-year-old man with diagnosed Gorham-Stout syndrome was followed from 2021 to 2024 by a multidisciplinary group of specialist from several medical institutions of Saint-Petersburg, Russia.
Results. A year before the first manifestations of the disease, the patient had few health problems: in 2019 at the age of 45, he suffered a chest injury as a result of a traffic accident, traumatic cyst of the spleen, cystectomy with splenic preservation, and in September 2020 pneumonia caused by COVID-19. In August 2021 he began to experience shortness of breath during exercise. During the examination a massive pleural effusion was detected. Thoracentesis was performed, and the test results confirmed chylothorax. Up to 4 liters of exudates were removed. Right-sided osteolytic destruction of Th10-Th12 vertebral bodies and 4, 7, 11 ribs were revealed (Fig.). Pleura biopsy with histological study revealed diffuse lymphangiomatosis. Diagnosis of Gorham-Stout syndrome was supposed. As a result of complex medical interventions including pleurotomy, infusions of zoledronic acid and prescription of sirolimus 11 month remission was achieved. Since November 2023, the patient has repeatedly received hospital treatment for bacterial pneumonia, exacerbations of the underlying disease, and pulmonary embolism, which resulted in death.
Conclusion. Gorham-Stout syndrome is an extremely rare disease characterized by proliferation of lymphatic vessels within bones and related tissues. The etiology is unknown. The presented case may be related to a previous chest injury and pneumonia caused by COVID-19. The osteolytic process was quite easily stopped by repeated administration of zoledronic acid, sirolimus and, possibly, pleurotomy, which helped to achieve remission, but did not cure the disease.



P1377

OSTEITIS FIBROSA CYSTICA: A POST-TRAUMATIC MANIFESTATION OF A BROWN TUMOUR IN A PATIENT WITH SECONDARY HYPERPARATHYROIDISM DUE TO END-STAGE RENAL DISEASE: A CASE REPORT

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Introduction: Secondary hyperparathyroidism represents a complex alteration in bone and mineral metabolism that occurs as a direct result of chronic kidney disease. Brown tumors are benign lesions caused by persistently elevated levels of the parathyroid hormone and uncontrolled bone resorption which represent a serious complication of renal osteodystrophy .

Case presentation

A 37-year-old man was admitted to our endocrinology department with severe clavicle and right hand pain developed after the injury. He was diagnosed with end-stage renal disease at the age of 27 due to a congenital anomaly of the urinary system and has been treated with haemodialysis for 10 years. Secondary hyperparathyroidism (sHPT) manifested at the age of 33. During the last follow-up, laboratory tests revealed elevated PTH 624 pg/ml (15-65), Ca adj. at 2,1 mmol/l (2,15-2,55), normophosphatemia – 1,09 mmol/l (0,74-1,52). These results were obtained on multicomponent therapy: cinacalcet 60 mg/day, elemental calcium – 420 mg, selevamer 4800 mg/day, alfacalcidol 0,5 mg/day. BMD assessed by Dual-energy X-ray absorptiometry scan revealed a Z-score of – 2.2 SD at the femur neck and – 4.9 SD at the radius. Computed tomography and magnetic resonance imaging visualized multiple osteolytic lesions of the 3rd right carpal bone (2.2x3.1x1.7 cm) with pathological fracture of the right clavicle (2.7x5.2x3.5 cm) and the right iliac wing (5,1x4,4x2,2 cm). Scintigraphy with 99mTc showed diffuse uptake in the right clavicle and the right iliac wing. According to histological examination giant cell mass

without evidence of cellular atypia was confirmed assessed as a brown tumour. Despite the relatively small increase in PTH above the target range, the patient exhibited severe bone manifestations of MBD-CKD, which indicated the surgical treatment.

Conclusion: Brown tumours are challenging in patients with chronic kidney disease. Healthcare professionals need to be aware of this condition and its further management.

P1378

SEVERE PREGNANCY-ASSOCIATED OSTEOPOROSIS IN YOUNG WOMAN: CASE REPORT

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Objective

Pregnancy and lactation-associated osteoporosis (PLO) is a rare condition typically associated with non-traumatic vertebral fractures during the third trimester and/or the first months of postpartum. We present a clinical case of severe PLO in a young woman with ankylosing spondylitis.

Results

A 26-years-old woman presented with back pain and was immobilised for several months following her first delivery. She was treated with glucocorticoids, analgesics with mild beneficial effects. MRI showed a decrease in the height of Th4-12 (20-44%), L1-4 (21-40%). BMD assessed by DXA scan revealed a Z-score of -3.0 SD at L1-4, -2.0 SD at the femoral neck. She had menarche at 12 years of age, regular menstrual cycle prior to pregnancy, no history of fractures and common risk factors such as smoking, alcohol abuse, use of osteoporosis risk medications. Secondary causes of osteoporosis were excluded. Since 2019 she received teriparatide 20 mcg/day with colecalciferol and calcium for two years, followed by three infusions of zoledronic acid 5 mg/year with positive BMD dynamics: at the L1-4 0.6 SD, femoral neck -1.7 SD. MRI showed no negative vertebral height dynamics. There was no decrease in 1,25(OH)2 vitamin D; 25(OH)vitamin D. After zoledronic acid infusion, we observed suppression of bone remodelling markers. The patient still has moderate back pain, probably due to concomitant HLA-B27 negative ankylosing spondylitis, which was diagnosed in 2019 at additional examination. We decided to discontinue the anti-osteoporotic therapy and to add alfacalcidol 0.25 mcg/day accompanied with calcium carbonate 1000 mg/day. We also emphasized physical activity. In addition, we performed a genetic panel analysis to exclude a hereditary condition of low bone mass (in progress).

Conclusion

PLO is a rare but serious condition and must be considered in the differential diagnosis of back pain and vertebral fractures in the postpartum period.

P1379

PARATHYROID CANCER: A RARE CASE WITH SEVERE HYPERPARATHYROIDISM COMPLICATIONS

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Introduction: Parathyroid carcinoma (PC) is a rare malignancy, often associated with severe hyperparathyroidism, hypercalcemia and bone and renal complications.

Case Presentation: A 34-year-old man had suffered from progressive joint pain since 2022, unresponsive to analgesic drug. X-ray imaging revealed destructive changes in the hip and knee joints, and a tumor mass in the right femur with a high risk of low-energy fracture.

Blood tests showed high albumin adjusted calcium level 3.74 mmol/L (2.15–2.55), PTH 2030 pg/mL (15-65), and phosphorus 0.69 mmol/L. Ultrasound (US) visualized nephrolithiasis accompanied with normal filtration rate (101 mL/min/1.73 m^2). DXA scans revealed decreased BMD (Z-score) in the radius, lumbar spine and femoral neck (-5.8 SD, -4.0 SD and -4.4 SD, respectively). We excluded vertebral compression fractures by X-ray. Destructive changes in the upper third of the diaphysis of the right femur were considered as cystic fibrous osteitis. Initial treatment included intravenous hydration (3000 mL/day) and cinacalcet (90 mg/day), with follow-up denosumab 60 mg injection due to poor response.

Neck US and Technetium-99m MIBI scan identified a tumor of left inferior parathyroid gland 2.9 cm. Besides there was a papillary thyroid carcinoma of the right lobe 8 mm, confirmed with FNA biopsy.

In July 2024, the patient underwent selective left inferior parathyroidectomy and right hemithyroidectomy. Histology confirmed PC and thyroid microcarcinoma. Postoperatively, PTH levels dropped to 30.6 pg/mL, and albumin adjusted calcium to 2.1 mmol/L within 24 hours. Patient received calcium carbonate 3000 mg/day, cholecalciferol 10000 UI/day for 2 months with normocalcemia achievement.

Conclusion: The diagnosis of PC is highly challenging and requires integration of clinical, biochemical and radiological data, alongside careful evaluation of systemic manifestations.

P1380

OSTEITIS FIBROSA CYSTICA: AN UNOBVIOUS SIGN OF PRIMARY HYPERPARATHYROIDISM

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Introduction: Osteitis fibrosa cystica (OFC) is a skeletal disorder associated with long-standing, severe hyperparathyroidism.
Case presentation: A 64-year-old female presented with intense headaches persisting for three months. MRI and CT scans revealed two non-cystic lesions in the right frontal and sphenoid bones, measuring 30×25×15 mm and 14×44 mm, respectively, with deformation of adjacent antero-basal sections of the right frontal lobe. Differential diagnosis included fibrous dysplasia, hyperparathyroidism, Paget's disease, and metastatic cancer.
Laboratory tests confirmed primary hyperparathyroidism (PHPT): PTH – 168 pg/mL (15–65), Ca (adj.) – 2.9 mmol/L (2.15–2.55), P – 0.7 mmol/L (0.74–1.52), ALP – 324 U/L (40–150), and elevated urinary calcium excretion – 9.2 mmol/day. Ultrasound revealed nephrolithiasis in both kidneys with normal renal function (eGFR – 92 mL/min/1.73 m²). DXA scans indicated severe bone mineral density reduction in the radius, lumbar spine, and femoral neck (T-scores: -6.6 SD, -6.4 SD, -3.9 SD). Spinal x-ray detected vertebral compression fractures at Th8–9 and L1–4. Neck ultrasound and 99mTc-Sestamibi scintigraphy visualized tumors in the right lower and left upper parathyroid glands (0.9×2.2×1.5 cm and 1.7×0.9×2.2 cm). Hereditary history is unremarkable.
In August 2024, the patient underwent parathyroidectomy, two adenomas were removed. Post-surgery, PTH decreased to 13 pg/mL, Ca – 2.0, indicating remission. She was discharged on alfacalcidol (1 mcg/day) and calcium carbonate (500 mg/day).
Conclusion: This case highlights PHPT presenting with large bone lesions, initially suggestive of Paget's disease or metastatic cancer. Radiologic findings of lytic foci and hypercalcemia should prompt consideration of PHPT in differential diagnosis.

P1381

EOSINOPHILIC FASCIITIS: A RARE CASE WITH INITIAL JOINT INVOLVEMENT IN A MOROCCAN PATIENT

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Eosinophilic fasciitis is a rare, localized disease, first described by Shulman in 1974. It belongs to the category of sclerotic connectivites, although its etiology remains unknown. We report the case of a 66-year-old Moroccan female patient with type 2 diabetes and depression, who presented with inflammatory arthralgias affecting mainly the large and medium joints, associated with myalgias. Her symptoms worsened a few months later, with the appearance of progressive induration of the skin on the forearms and legs, resulting in limited joint mobility. The patient had neither Raynaud's phenomenon nor digital sclerosis. Biological tests revealed mild eosinophilia (700/mm³) and a moderate inflammatory syndrome (CRP 12 mg/L), while the immunological work-up was negative. A deep skin biopsy confirmed the diagnosis, demonstrating dermo-hypodermal and fascial fibrosis characteristic of eosinophilic fasciitis. Although rare, eosinophilic fasciitis is a potentially disabling condition. Joint involvement is rarely as initial symptom of consultation. Diagnosis is based on a combination of clinical, radiological (notably MRI) and histological findings, the latter being essential to confirm the pathology. Treatment combines corticosteroids and immunosuppressants or immunomodulators, with generally favorable outcomes.

P1382

A SYSTEMATIC REVIEW COMPARING MEDIALISING CALCANEAL OSTEOTOMY, LATERAL COLUMN LENGTHENING AND A COMBINATION OF BOTH AS A TREATMENT OPTION FOR STAGE 2 ADULT ACQUIRED FLATFEET.

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Background: adult acquired flatfoot deformity (AAFD) is characterised by the collapse of the medial longitudinal arch (MLA), forefoot abduction and hindfoot valgus. Stage II AAFD is where the deformity is flexible and while is initially treated conservatively, as disease progression occurs surgical intervention becomes imperative. Lateral column lengthening (LCL) and medialising calcaneal osteotomy (MCO) are both cornerstone reconstructive procedures for correcting AAFD. However, there is no clear consensus on the degree to which, each procedure can correct deformity.
Objectives: The aim of this study was to perform a systematic review comparing the capacity of LCL, MCO and a combination of both at correcting stage II AAFD.

Methods: The publishing platforms OVID (Medline) and Pubmed were used to search for relevant studies. This review was conducted in line with the Preferred Reporting Items for Systematic Reviews and Meta- Analysis (PRISMA) guidelines.
Results: Ten studies met the eligibility criteria and were included in this review. Procedures were compared using a functional score such as the AOFAS scale and the radiological parameters: lateral talo-first metarsal (LTMT) angle, calcaneal pitch (CP), Kite's angle, anterior posterior talo-first metatarsal (APTMT) angle and talonavicular coverage (TNC) angle.
Irrespective of the type of reconstruction, post-operative improvement in functional scores was observed. Radiologically, LCL had a greater capacity to improve and maintain the LTMT angle, CP, APTMT angle and TNC angle post-operatively. MCO showed the greatest improvement and maintenance of Kites angle. Despite LCL superior corrective capacity, it was also associated with the highest complication rates of all surgeries.
Conclusion: LCL has a greater capacity to realign the midfoot and correct forefoot abduction than MCO however, has a higher complication rate. Alternatively, MCO had a lower complication rate but was limited to correction of the hindfoot valgus.

P1383

EVALUATION OF VITAMIN D LEVELS IN PATIENTS WHO HAD FEMORAL FRACTURE AND WAS ADMITTED IN MAJOR TRAUMA HOSPITAL IN UK

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Objective: Vitamin D support skeletal health and improve bone mineralization by increasing intestinal calcium absorption, reducing secondary hyperparathyroidism and decreasing bone turnover.
Vitamin D can cause isolated and generalised musle pain and bone pain
Lower Level of Vitamin D are associated with High risk of fall and Fracture
Aim: To look into which group of patient with femoral fracture were deficent in Vitamin D at the time of admission
Inclusion & Exclusion creteria: All patient admitted with femoral fracture And age more than 60 were included
All patients with other Lower limb fracture and other fracture were excluded
Method & Material Data was collected from the notes and blood result of all the patients who were admitted with femoral fracture.
We looked at the peroid between 1 January 2024 to 30th November 2024. It was a retrospective study of 823 patients admitted during these period.
Result : There were 823 patients admitted in these period , out of which 555 Patients(68%) Female and 268 Patients(32 %) were female.
Patients were between 60-99 years.
There were 148((18%)patients from care home and 675(82%) patients were from thier own home.
Patients admitted from Care home ,63 out of 148 patients (42%) were insufficient ,54 patients were sufficient(36%) and 32 patients (21%) did not had Vitamin D levels checked.
Patient admitted from thier home 288 patien(43%)were insufficient,229 patients(34%) were sufficient and 157 patients(23%) did not had VitaminD level checked
Vitamin D level were checked in 657 (79%) patients. We found 283 (43%) patients were sufficient and 374(56%) patients were insufficient
Of these patients who were sufficient with Vitamin D group- 69% were Female & 30.9% were Male
Amoung Sufficient group ,154 patients had VitaminD level between 50-74. Female in this group were 95 and 54 were male.
Patient who had vitaminD level above 75 were129 in total. Among these group we had 101 female and 28 Male
Conclusion: Most of the patients came from thier home with fracture and were women. More patients were deficients in vitaminD than sufficient Percentage of patients with insufficient vit D level remain same whether they were admitted from home or care home.
Age group with the highest average % of patients who were admitted and sufficient with Vitamin D - 70-74.
Second highest age group was 85-89.
Age groups with the lowest average % of Vitamin D admitted patients - 65-69, 80-84, 90-94.
Patients who are most likely to not have sufficient Vitamin D are Men 65-69 who reside in Care and Wmen 65-69 who reside in Care
Reference Vitamin D and calcium for the prevention of Fracture A systemic review and meta analysis
Pang Yao, PhD[1]; Derrick Bennett, PhD[1]; Marion Mafham, MD[1]; et alXu Lin, MD, PhD[2,3]; Zhengming Chen, DPhil[1,4]; Jane Armitage, FRCP[1,4]; Robert Clarke, FRCP, MD[1]
Author Affiliations Article Information
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P1384

THE FATTY ACID BINDING PROTEIN 5 INHIBITOR ART26.12 IS A NOVEL ANALGESIC FOR OSTEOARTHRITIS PAIN

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Objectives
The chronic pain associated with osteoarthritis (OA) is difficult to treat due to the complex pain signaling pathways involved. Non-steroidal anti-inflammatory drugs (NSAIDs) have short-term efficacy but pose risks such as elevated blood pressure and gastrointestinal ulcers. ART26.12 is an orally active, selective fatty

acid binding protein 5 (FABP5) inhibitor with antinociceptive and anti-inflammatory properties in multiple inflammatory and neuropathic pain models in Phase 1 development. This study aimed to investigate the potential efficacy of ART26.12 in reducing OA pain.

Material and Method

Experiments were conducted by the Stony Brook University Institutional Animal Care and Use Committee (#277150). Female, 12-week-old Sprague Dawley rats underwent surgical destabilization of the medial meniscus. Eight weeks following surgery, rats were subdivided into five groups (all n=10); vehicle, naproxen (8mg/kg), and ART26.12 (10, 25, and 50mg/kg) orally. Static incapacitance (ratio of ipsilateral to contralateral hindlimb weight bearing) was measured 1 h after the first drug dose, and weekly over a 28-day twice daily treatment regime.

Result

No changes in incapacitance were found in the vehicle-treated group at any point over the 28-day treatment regime. ART26.12 increased weight bearing on the ipsilateral (arthritic) limb in a dose-dependent manner (10–50 mg/kg) after the first dose of ART26.12, and at each weekly measurement of incapacitance, with no signs of tolerance. The average increase in weight bearing after 4 weeks of treatment was 20, 24, and 30% in the ART26.12 groups (10, 25, and 50 mg/kg, respectively) and 31% in the naproxen group (versus 4% in the vehicle group).

Conclusion

Acute and repeated oral treatment with ART26.12 reduces OA pain in the ipsilateral limbs with a similar effect size as naproxen. ART26.12 is a promising non-opioid, non-steroidal treatment alternative for chronic OA pain.

P1385

PRESCRIPTION HABITS FOR OSTEOPOROTIC TREATMENTS AMONG SPANISH GYNECOLOGISTS: RESULTS FROM AN AEEM SURVEY

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Objective(s) To evaluate the prescription habits, clinical practices, and perceived barriers in osteoporosis management among Spanish gynecologists, emphasizing their pivotal role in the prevention and treatment of this prevalent condition in postmenopausal women.

Material and Methods An official online survey was conducted, designed by the Osteoporosis Group and approved by the Board of the Spanish Association for the Study of Menopause (AEEM). The survey consisted of 14 closed-ended questions addressing prescription habits and clinical decision-making in osteoporosis. A total of 205 specialists participated, 87% of whom were gynecologists, with 60.6% having over 15 years of clinical experience.

Results Among respondents, 54% reported seeing 1–10 patients with osteoporosis weekly, while 36% requested 1–5 densitometries monthly. For osteopenia, 50% prescribed calcium + vitamin D, and 57% combined it with osteoporosis treatments. Bisphosphonates and menopausal hormone therapy (MHT) were the most frequently used first-line treatments. Denosumab was prescribed by 57% as a second-line option and by 54% in cases of severe osteoporosis. Following osteoporotic fractures, 28% preferred bisphosphonates and 27% denosumab, with 43% conducting the first densitometric control at 1–2 years.

In terms of professional training, 43% of respondents reported acquiring knowledge through courses, while 30% acknowledged a lack of formal education in osteoporosis management. Notably, 63% expressed feeling little to no confidence in treating patients with osteoporosis.

Conclusion(s) This study highlights significant variability in osteoporosis management among Spanish gynecologists, driven by disparities in training and clinical experience. These findings underline the need for enhanced educational initiatives to standardize practices and improve confidence in managing this condition. The frequent use of menopausal hormone therapy (MHT) among gynecologists, particularly in patients with vasomotor symptoms that compromise quality of life, is notable. Evidence supports MHT's dual role in alleviating symptoms and improving bone mineral density (BMD), making it an essential component of comprehensive osteoporosis care. Strengthening its role in clinical guidelines and training programs could further optimize care for postmenopausal women.

P1386

AREAS FOR IMPROVEMENT IN THE MANAGEMENT OF OSTEOPOROSIS BY GYNECOLOGY SPECIALISTS

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Objective: To analyze survey results regarding prescription habits for postmenopausal osteoporosis among gynecology specialists, comparing them with current evidence to identify potential areas for improvement.

Materials and Methods: An official online survey was conducted, designed by the Osteoporosis Group and approved by the Board of the Spanish Association for the Study of Menopause (AEEM). The survey comprised 14 closed-ended questions addressing prescription habits and clinical decision-making in osteoporosis. A total of 205 specialists participated, 87% of whom were gynecologists, with 60.6% having over 15 years of clinical experience.

Results: "Gynecology specialists treat a sufficient volume of patients with osteoporosis (OP) to gain experience in its management, as more than 90% care for patients with this condition. Over 80% request bone densitometry as part of active management. Osteopenia is primarily treated with calcium and vitamin D. For first-line treatments of OP, bisphosphonates and hormone replacement therapy (HRT) are most commonly used, with denosumab being the clear second-line treatment (57.9%). In patients with severe OP and high fracture risk, the treatment of choice is teriparatide (32.1%), and bone-forming agents (40%) are also fre-

quently used. The vast majority of specialists prescribe calcium and vitamin D for OP (98%). To assess treatment efficacy, most request bone densitometry within the first two years (80%). In patients with a previous fracture, bone-forming agents are used in 35% of cases.
Only 7% of gynecology specialists have received in-person training on OP. Additionally, 62% of professionals feel either uncomfortable or only somewhat comfortable managing OP."
Conclusions: Osteoporosis can be diagnosed through densitometry, and we should increase its utilization to improve diagnosis rates. The approach to osteopenia should primarily focus on lifestyle modifications. Osteoporosis treatments must be individualized; for patients experiencing hot flashes, hormone replacement therapy (HRT) should be considered as first-line treatment. The use of denosumab as a second-line treatment can be appropriate in many cases due to improved adherence from its ease of use, though this should be individualized. We now recognize that for women at high fracture risk, treatment with bone-forming agents is prioritized for net bone gain. Calcium and vitamin D supplementation must be maintained in patients receiving antiresorptive and bone-forming medications. Treatment effectiveness should be monitored with regular densitometry scans, especially in high-risk fracture patients, every 1-2 years. After a fracture, treatment modification should be considered, including evaluation of bone-forming agents. To improve care for women with osteoporosis, structured training through specialized menopause units is essential. Currently, healthcare professionals' confidence and motivation in managing osteoporosis are low, which are crucial aspects that need addressing to ensure proper medical care.

P1387

REFINING EARLY DETECTION OF LOW BONE MINERAL DENSITY: A DEEP LEARNING MODEL FOR OSTEOPENIA SCREENING USING CHEST RADIOGRAPHS

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Objective(s): We developed and validated a deep learning model to classify osteoporosis, osteopenia, and normal bone mineral density (BMD) from standard frontal chest radiographs. This framework offers finer categorization, enabling earlier identification of osteopenic individuals and more timely DEXA referrals for those at moderate risk.
Materials and Methods: We expanded our PROS CXR:OSTEO product—which initially achieved high accuracy (AUC = 0.94 in internal validation) in classifying osteoporosis versus non-osteoporosis—to further differentiate osteopenia from normal within the non-osteoporosis category. Training data comprised 46,048 chest radiographs from Hospital A (South Korea), categorized by DXA T-scores, augmented with 16,265 unlabeled images from public datasets, totaling 62,313. For internal validation, 1,989 chest radiographs from Hospital A were used. For external validation, we collected datasets from three independent institutions spanning secondary healthcare (Hospital B), a facility serving veterans (Hospital C), and a global platform (Platform D).
Results: Our framework achieved an AUC of 0.93, sensitivity of 0.94, and specificity of 0.72 in classifying normal and osteopenia on External A (88.9% female; mean age 59.0 years), an AUC of 0.83, sensitivity of 0.78, and specificity of 0.82 on Hospital B (55.5% female; mean age 59.3 years), an AUC of 0.83, sensitivity of 0.73 and specificity of 0.67 on Hospital C (44.8% female; mean age 73.6 years), and an AUC of 0.78, sensitivity of 0.75, and specificity of 0.77 on Platform D (95.4% female; mean age 67.2 years).
Conclusion(s): Our model effectively classified osteopenia from normal BMD within the non-osteoporosis category, helping identify individuals at risk of reduced bone density and potentially enabling earlier intervention for osteopenia and osteoporosis.

P1388

ENHANCING OSTEOPOROSIS DETECTION IN CHEST X-RAY WITH A LARGE-SCALE VISION FOUNDATION MODEL: A MULTI-INSTITUTIONAL STUDY

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Osteoporosis often remains undiagnosed until fractures occur, causing significant individual and societal burdens. Although dual-energy X-ray absorptiometry (DXA) is the diagnostic standard, its limited accessibility hinders early detection. To address this, we developed a large-scale chest X-ray (CXR)-based foundation model for robust osteoporosis classification across multiple institutions in diverse clinical environments, aiming to enable early risk identification.
We developed a vision foundation model trained on approximately 700,000 open-access frontal CXRs using self-supervised learning. This model captured diverse radiographic features from variations in CXR equipment and institutional practices. Subsequently, we fine-tuned the foundation model using a dataset of paired CXRs and DXA T-scores to classify osteoporosis and evaluated its performance on three datasets (A-C). Datasets A and B came from the same institution, representing health screening and outpatient clinic data, respectively, while Dataset C consisted of screening data from a secondary healthcare center. We compared the performance between the foundation model and a simple CNN model, noting significant improvements.
The AUCs and sensitivities using the foundation model were 0.96 and 0.83 for Dataset A, 0.87 and 0.84 for Dataset B, and 0.91 and 0.95 for Dataset C. In comparison, the performance without foundation model achieved AUCs and sensitivities of 0.96 and 0.68 for Dataset A, 0.88 and 0.68 for Dataset B, and 0.91 and 0.57 for Dataset C. While the AUCs were comparable across models, the foundation model demonstrated substantially higher sensitivities for all datasets.
By integrating a vision foundation model trained on large scale, diverse CXR data, we achieved comparable AUCs and higher sensitivities across all datasets compared to a simple CNN model, highlighting its potential to enhance robustness and generalizability in osteoporosis classification.

P1389

MODULATION OF INFLAMMATORY AND SKELETAL MUSCLE DIFFERENTIATION MARKERS IN C2C12 CELLS TREATED WITH NARINGENIN AND HESPERETIN PHASE II METABOLITES

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C2C12 cells, a widely used murine myoblast cell line, were treated with varying concentrations of naringenin and hesperetin phase II metabolites (0, 0.1, and 1 mg/dL) alongside LPS (to stimulate inflammation) and DEXA (to stimulate sarcopenia), in order to investigate the modulation of inflammatory and muscle differentiation markers.

The study focused on several key proteins, including TNF-alpha, IL-8, ERK1/ERK2, IGFBP2, MYOD1, Myogenin, N-cadherin, AMPK alpha-1/2, and P53. Naringin and hesperidin, among the main representative polyphenols of bergamot, in vivo are hydrolyzed to the relative aglycones naringenin and hesperetin and further metabolized as phase II metabolites, which are the main circulating species.

Naringin and hesperidin, the primary polyphenols in bergamot, are hydrolyzed in vivo to their respective aglycones, naringenin and hesperetin, and further metabolized into phase II metabolites, which represent the main circulating forms. In vivo studies have demonstrated that naringenin and hesperetin possess significant anti-inflammatory activity, supporting their potential therapeutic applications. [10.1002/ptr.5292].

This study focused on the potential effects of the phase II metabolites on inflammatory responses and myogenic differentiation in C2C12 cells. Notably, TNF-alpha is known to inhibit myogenic differentiation through NF-κB activation, while IL-8 and other markers may play roles in muscle regeneration and inflammation. The signaling pathways involving ERK1/ERK2 and AMPK are crucial for cellular responses to stress and energy metabolism, which are particularly relevant in muscle cells. Preliminary results suggest that treatment with naringenin and hesperetin metabolites may alter the expression levels of these markers, potentially enhancing myogenic differentiation while mitigating inflammation. This indicates that naringenin and hesperetin phase II metabolites derived from bergamot polyphenols could serve as a beneficial agent in muscleskeletal-related therapies, particularly under conditions characterized by elevated inflammatory cytokines. Further analysis will be required to fully understand the underlying mechanisms and confirm these effects in C2C12 models.

P1390

ASSOCIATION OF HYPERTENSION AND CENTRAL OBESITY WITH RADIOGRAPHIC SEVERITY IN HAND OSTEOARTHRITIS: FINDINGS FROM A POPULATION-BASED STUDY

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Objective. Hand osteoarthritis (HOA) is a clinically heterogeneous disease. The role of cardiometabolic factors and obesity in its radiographic progression remains unclear. This study aims to investigate the association between cardiometabolic factors, obesity, and radiographic severity in patients with HOA.

Materials and Methods. A cross-sectional analysis of a community-based cohort in Portugal included participants with HOA (≥1 joint with Kellgren-Lawrence (KL) grade ≥ 2 and/or American College of Rheumatology criteria). Patients with other osteoarticular conditions were excluded. Radiographic severity was assessed using the sum of the KL hand score (range 0-128). Cardiovascular risk factors, anthropometric individual measures and self-reported cardiovascular events were collected. We tested the associations between these factors and radiographic severity by multivariable linear regression, adjusted for age, sex, and education.

Results. Of 858 participants with HOA (61% women, mean age 59.6 years), 807 met radiographic criteria. Among these, 70% were overweight or obese, 80% hypertensive, 94% had dyslipidaemia, and 21% were diabetic. Body Mass Index (BMI ≥ 30), waist circumference, and waist-to-height ratio were associated with radiographic severity (β 1.78, 95% CI 0.10; 3.46), (β 0.06, 95% CI 0.01; 1.12), and (β 0.10, 95% CI 0.08; 0.19), respectively. Hypertension was also associated with radiographic severity (β 1.93, 95% CI 0.02, 3.9), while diabetes and dyslipidaemia showed no association.

Conclusion. Central obesity and hypertension are associated with radiographic severity in HOA, highlighting their potential systemic effects on radiographic progression. These findings underscore the importance of addressing obesity and hypertension as potential modifiable risk factors in the management of HOA progression, with a focus on preventive and early therapeutic strategies. Further research is needed to validate these findings.

P1391

CORRELATION OF BODY MASS INDEX AND BONE MINERAL DENSITY IN MENOPAUSAL WOMEN WITH TYPE 2 DIABETES

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Introduction : That type 2 diabetes (T2D) may adversely affect bone health was suggested more recently. The pathophysiological mechanisms are complex, particularly as obesity is very common in patients with T2D and is itself associated with an increased risk of fractures at specific sites. The aim of this study was to examine relationship between body mass index (BMI) and bone mineral density (BMD) in a group of menopausal women with T2D.
Material and methods: The study involved a group of 100 post-menopausal women with T2D aged 59,08+- 6,07 All subjects had good glycoregulation (HbA1c 7,2 %) and their BMI has been determined. BMD was determined by DXA method by Hologic QDR 4500 C unit . BMD was measured at central skeleton (lumbal spine and both hips). According to densitometry finding, the criterion for osteoporosis is T score less than −2.5 SD. BMI values were correlated with total T score values of the lumbal spine and both hips, as well as total T score values of spine and hip.
Results: Results have shown that median BMI value was found in 28,27 ± 4,12 . Median lumbal spine T score was − 2,19 SD ± 1,25, and hip T score − 1.11 SD ± 0.95. A statistically significant positive correlation (r = 0.01) was found between BMI and BMD of the hip, whereas between BMI and BMD of lumbal spine there was no statistically significant correlation. There was a statistically significant correlation (r = 0.01) between BMD values of lumbal spine and hip.
Conclusion: In postmenopausal women with T2D , BMI is more important predictor of hip BMD, as compared to spine BMD. BMD is variably elevated in T2D, an effect that would be expected to increase bone strength. BMD of hip is increased with the increase of BMI and height in obese postmenopausal women with T2D, probably caused by alterations in cortical bone microarchitecture and bone matrix. A lack of correlation between BMI and BMD of spine in postmenopausal women with T2D might be due to predominant effect of lack of estrogen and faster bone metabolism in spinal region.

P1392

PREDICTIVE FACTORS FOR HIP INVOLVEMENT IN JUVENILE IDIOPATHIC ARTHRITIS

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Introduction : Juvenile Idiopathic Arthritis (JIA) is a serious and disabling disease that occurs in a growing organism. Among the joints commonly affected by JIA, the hip stands out as a pivotal site that can significantly impact the functional prognosis of the disease.
Objectives : investigate the determinants of hip involvement in patients with JIA.
Methods : A retrospective study was conducted involving patients diagnosed with JIA based on the European League Against Rheumatism (EULAR) criteria. We divided our population into 2 groups: G1 (with hip involvement) and G2 (without hip involvement). Demographic, clinical, and biological data, including the neutrophil/lymphocyte ratio, were studied and compared between the two groups.
Results: The study included a cohort of 42 patients (15 males and 27 females), with a mean age of 37.55 ± 14.26 years [16-76] at the time of the study. The average age at disease onset was 14.63 ± 6,79 years, the mean disease duration was 21.85 ± 12.49 years.
Hip involvement was detected in 16 patients, with bilateral involvement in 10 cases. The average time from disease onset to hip involvement was 13.64 ± 8.98 years.
On biological data, twenty-eight patients (68.3%) exhibited a biological inflammatory syndrome. The mean neutrophils and lymphocytes were 6595 ±4416 per mm³ and 2187 ± 1022 per mm³, respectively. The mean neutrophil-to-lymphocyte ratio was 3.36 ± 3.33.
Statistical analysis revealed that hip involvement was associated with the age of disease onset ((G1 10.81 ± 3.7 vs G2 years 19.52 ± 14.59, p=0.011) and neutrophil-to-lymphocyte ratio (p=0.013). Male gender was associated with lower risk of hip involvement (OR= 0.205 95%IC [0.051 - 0.826], (p=0.021). However, factors such as mean disease duration, smoking status, presence of biological inflammatory syndrome, did not show significant associations with hip involvement.
Conclusion
Hip involvement is a common complication in JIA and represents a significant prognostic factor. Thus, it is imperative to identify associated risk factors such as age and gender. Moreover, the neutrophil-to-lymphocyte ratio holds promise as a potential future predictive marker for hip involvement in this condition.

P1393

HIVO: INVESTIGATING OSTEOPOROSIS IN HUMAN IMMUNODEFICIENCY VIRUS PATIENTS – SCREENING GAPS AND RISK ASSESSMENT IN A CLINICAL COHORT FROM A TERTIARY PORTUGUESE CENTER

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Objectives: This study aims to evaluate adherence to the EACS [European AIDS (acquired immunodeficiency syndrome] Clinical Society Guidelines for osteoporosis screening in HIV (human immunodeficiency virus) individuals. The secondary objective is to assess the need of raising awareness among infectious disease specialists about the topic and to evaluate the importance of establishing a standardized referral protocol for Rheumatology appointments.

Material and Methods: this single-center retrospective longitudinal study included a cohort of HIV 1 and 2 patients aged 40-50 years old, randomly selected, followed at the Infectious Diseases Department from January to December 2024. The ones with prior osteoporosis diagnosis and/or treatment, hepatitis B/C co-infection and less than one year of follow-up were excluded. Data was collected from electronic medical record reviews, ensuring patients' confidentiality.

Results: Forty-six patients (15 women and 31 men) were included with a mean age of 44±3SD years. Smoking was reported by 24% of individuals, while alcohol misuse by 4.3%. Early menopause was reported in 1 woman, while no other major risk factors for osteoporosis were identified. Patients had a mean time since AIDS diagnosis of 11±6SD years. 73.9% were either currently or previously treated with osteoporosis-inducing antiretroviral therapy, for an average of 7±5SD years. None of the patients had registered fragility fractures. Neither FRAX (fracture risk assessment tool) nor DXA (dual-energy X-ray absorptiometry) were performed on any of the patients. Vitamin D was prescribed in 4.3% of the patients, but no additional calcium or anti-osteoporotic therapy was administered.

Conclusion: To our knowledge, this cohort study is the first to evaluate adherence to the EACS Guidelines for osteoporosis screening. These findings suggest a lack of adherence to the guidelines and reveal the need to increase awareness among infectious diseases physicians for the screening tools available to calculate bone fracture risk. Prospectively, we intend to create a referral protocol to Rheumatology appointment for those with high risk and reevaluate the outcomes after its implementation.

P1394

RELATIONSHIP BETWEEN VITAMIN D STATUS AND VARIOUS DISEASES: CLINICAL SIGNIFICANCE

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Objective: To assess the clinical significance of vitamin D levels in various diseases in patients living in Sarajevo Canton.

Material and Methods: This study investigates the relationship between vitamin D status and several diseases (osteoporosis, breast cancer, and spinal deformities in children aged 8 to 12 years) in patients residing in Sarajevo Canton. Serum vitamin D levels were measured in nanograms per milliliter (ng/ml). Bone mineral density (BMD) was assessed at the lumbar spine and proximal femur using Dual-Energy X-ray Absorptiometry (DXA). Spinal deformities were diagnosed clinically and radiographically.

Results: In patients with osteoporosis (n=118), the mean vitamin D level was 17.3 ng/ml, ranging from 3 ng/ml to 65.9 ng/ml. Low serum vitamin D levels were observed in 87.2% (n=103) of patients, with a mean value of 14.5 ng/ml, ranging from 3 ng/ml to 29.4 ng/ml. Normal vitamin D levels were recorded in 12.8% (n=15) of patients, with a mean of 34.5 ng/ml, ranging from 30.4 ng/ml to 65.9 ng/ml.

In breast cancer patients (n=60), the mean vitamin D level was 15.6 ng/ml, ranging from 3.2 ng/ml to 45.5 ng/ml. Low vitamin D levels were observed in 93.7% (n=56) of patients, with a mean value of 14.4 ng/ml, ranging from 3.2 ng/ml to 28.4 ng/ml. Normal vitamin D levels were recorded in 6.3% (n=4) of patients, with a mean of 34.5 ng/ml, ranging from 30.6 ng/ml to 45.5 ng/ml.

In children with spinal deformities (n=121), the mean vitamin D level was 28.5 ng/ml, ranging from 11.2 ng/ml to 51.2 ng/ml. Low vitamin D levels were found in 56.4% (n=68) of children, with a mean value of 21.7 ng/ml, ranging from 11.2 ng/ml to 29.8 ng/ml. Normal vitamin D levels were recorded in 43.6% (n=53) of children, with a mean of 34.5 ng/ml, ranging from 30 ng/ml to 51.2 ng/ml.

Conclusion: Our findings indicate that vitamin D deficiency/insufficiency is associated with the examined diseases. This suggests that assessing vitamin D status should be an integral part of the clinical protocol for these conditions.

Keywords: vitamin D status, osteoporosis, breast cancer, spinal deformities.

P1395

VITAMIN D METABOLITES AS MARKERS OF BIOCHEMICAL OSTEOMALACIA IN ADOLESCENTS

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Background: We previously observed a high prevalence of biochemical osteomalacia among apparently healthy Arab adolescents, using a proposed a combination of altered mineralization markers suggestive of osteomalacia. In this study, we aim to determine whether vitamin D metabolites, including vitamin D metabolite ratio (VMR), can serve as indicators of biochemical osteomalacia among Saudi adolescents.
Methods: A total of n=949 age- and body mass index (BMI) matched adolescents (n=513 girls, mean age=14.9 ± 1.8 years, mean BMI=23.0 ± 5.9; n=436 boys mean age=14.9 ± 1.7 years, mean BMI=23.7 ± 5.8) were included in this cross-sectional study. Anthropometrics were measured and biochemical parameters [25(OH)D (VD), calcium (Ca), inorganic phosphorus, alkaline phosphatase (ALP)] were assessed using assays. Circulating VD metabolites [24, 25 VD; VD2; VD3; total VD] were quantified using liquid chromatography-tandem mass spectrometry (LC-MS/MS). VMR was calculated as [24,25(OH)D/25(OH)D] × 100. VD deficiency cut-offs were defined as 25(OH)D <30nmol/L, 24,25(OH) VD <3.0nmo/L, VD2 limit of quantification (LOQ) <1.8 and VMR <4% based on proposed cut-offs. Biochemical osteomalacia was defined as any two of the four markers, namely low 25 (OH)D, high alkaline phosphatase (ALP), low calcium (Ca), and/or inorganic phosphorous (Pi). Predictive values (PVs), area under the curve (AUC) and Youden's index were calculated.
Results: With the exception of VD2, all VD metabolites were significantly lower in participants with biochemical osteomalacia. In all participants, 25(OH)D had the highest AUC [0.71, 95% CI 0.66-0.76; p<0.001], positive PV (0.11), negative PV (0.98) and Youden index (0.40). When stratified according to sex, the best marker for biochemical osteomalacia in girls was VMR [AUC 0.60, 95% CI 0.56-0.66; p=0.003], positive PV (0.18), negative PV (0.92) and Youden index (0.17)], while VD3 was the best in boys [AUC 0.77, 95% CI 0.6-0.94; p=0.001], positive PV (0.02), negative PV (0.97) and Youden index (0.60)].
Conclusion: VD metabolites as a single test are modest predictors of biochemical osteomalacia in adolescents and differ in accuracy according to sex.

P1396

THE ASSOCIATION BETWEEN MULTIMORBIDITY AND FALL RISK AMONG INDIVIDUALS AGED 50 YEARS AND OLDER IN IRAN- FINDINGS FROM STEPS 2021 SURVEY

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Objective: The aim of this study is to examine the association between multimorbidity and the risk of falls among individuals aged 50 years and older.
Material and Method: This study utilized data from STEPS 2021 survey and included individuals aged 50 years and older in the analysis. Five chronic disease; diabetes, hypertension, cardiovascular diseases (heart attack and stroke), hypercholesterolemia, and cancer were assesses based on self-reported and history of prior diagnoses. Participants were categorized into three groups: those with no chronic disease, one disease, and two or more diseases. The data were weighted to account for the sampling cluster used in the survey design. Multiple logistic regression with a backward stepwise approach was employed to examine the association between the number of multimorbidity and the risk of falls. The statistical precision and significance were evaluated using 95% confidence interval (95%CI) and P-value.
Result: A total of 10975 participants were included in the study. Of these, 53.14% had no chronic disease (95% CI 52.09–54.18), with a prevalence of falls in this group was 44.74% (95%CI 38.87–50.76). In comparison, 29.13% of participants had one chronic disease (95%CI 28.19–30.10), and 17.73% (95%CI 16.94–18.54) had two or more chronic diseases. The prevalence of falls in these groups was 30.31% and 24.95%, respectively (95%CI 24.99–36.22 for one chronic disease and 20.30–30.26 for two or more). The odds of falls were 1.10 times higher in individuals with one chronic disease compared to those without chronic disease (95%CI 0.81–1.49, P = 0.538). Furthermore, the odds was 1.48 times higher in individuals with two or more chronic diseases compared to those without any chronic disease (95%CI 1.09–2.02, P = 0.012).
Conclusion: The results indicate that the prevalence of falls in individuals over 50 years old with at least one chronic disease compared to those without any chronic diseases. These findings highlight the importance of implementing educational programs and preventive interventions to reduce fall risk in this age group, particularly among those with one or more chronic diseases.

P1397

PREDICTORS FOR AN UNDERLYING LOW BONE MINERAL DENSITY IN OLDER ADULTS POST-ACUTE STROKE IN MALAYSIA: A SINGLE-CENTRE STUDY

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Objective: Stroke is a risk factor of osteoporosis and quadruples the risk of fracture. This study aimed to identify the risk factors associated with low bone mineral density (BMD) among post-stroke older adults in a tertiary teaching hospital in Malaysia.
Material and Methods: This prospective cross-sectional study examined older adults aged 50 years and above admitted for acute stroke in Hospital Sultan Abdul Aziz Shah (HSAAS) Malaysia between March 2023 to July 2024. Areal BMD was assessed using a Dual-energy X-ray absorptiometry (DEXA) scan. Low BMD included both osteoporosis and osteopenia and was defined as T-score <-1.0. The chi-square test was used to compare the association between risk factors and low BMD, followed by binary logistic regression analysis. Data analysis was done using SPSS version 29.
Results: A total of 55 patients were included in the study. The mean age of participants was 64±7.06 years and 36% (n=20) were women. Malay-Bumiputera made up 92% (n=51) of the study population. The prevalence of low BMD was found to be 56.4% (n=31), with eight osteoporosis and 23 osteopenia detected. More women had osteoporosis compared to men (75% versus 46%, respectively). Gender (p-value 0.035, χ^2 = 4.438), ethnicity (p-value 0.018, χ^2 = 5.572) and National Institutes of Health Stroke Scale (NIHSS) score (p-value 0.033, χ^2 = 4.539) showed significant associations with low BMD. Binary logistic regression showed that higher NIHSS scores (OR: 7.632 95% CI: 1.079 – 53.96, p-value 0.042) and female gender (OR: 4.055 95% CI: 1.052 – 15.62, p-value 0.042) increased the likelihood of low BMD. We added HBA1C to the final model and found that elevated HbA1c levels reduced the odds of low BMD with borderline significance (OR: 0.746 95% CI: 0.557 – 1.00, *p*-value 0.05).
Conclusion: There was a high prevalence of low BMD in our study. After adjusting for gender, ethnicity, NIHSS and HBA1C, only high NIHSS and being female remained as significant positive predictors of low BMD in post-stroke older adults. Future research should focus on larger studies, screening and intervention in this cohort.

P1398

FALL RISK IN UNDERWEIGHT, OVERWEIGHT, AND OBESE INDIVIDUALS: EVIDENCE FROM NATIONAL SURVEY IN IRAN

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Objective: Falls are significant cause of fractures, and body weight has been identified as a key factor associated with fall risk. Low body weight is often associated with muscles weakness, whereas obesity is associated with balance difficulties. Therefore, this study aims to assess the association between central obesity and body mass index (BMI) with falling.
Method: Data from STEPwise Approach to Non-communicable Disease Risk Factor Surveillance (STEPs) survey in 2021 were utilized. The study included adults aged 18 years and older excluding pregnant women and individuals with severe physical or mental conditions. Body mass index (BMI) was used to classify participants into underweight (BMI≤19), overweight (25<BMI≤30) and obese (BMI≥30). The central obesity was assessed using waist-to-height ratio with values exceeding 0.5 considered indicative of obesity. The fall was assessed with a single question: Did you experience a fall in the past year? All analyses were conducted while controlling for age and sex, using logistic regression.
Results: A total of 27,490 individuals participated in the study, of whom 15,209 (55.3%) were female, and 663 (2.4%) experienced a fall in the past year. Falls were not associated with gender but showed a statistically significant relationship with age group. After adjusting for age, being underweight and overweight were not associated with an increased risk of falls compared to the individuals with normal BMI (OR=0.9 and OR=1.1, respectively). However, the odds of falling in obese individuals were 1.3 times higher than those with normal BMI (OR=1.3, 95% confidence interval (CI): [1.07, 1.59]). In this study, the association between central obesity and fall (adjusting for age) was not statistically significant. The odds of falling in individuals with central obesity was 1.2 times than in those without obesity (95% CI: [0.96, 1.48]).
Conclusion: According to the BMI, obese individuals had higher chances of falling. However, no significant relationship was found between central obesity and the occurrence of fall. Additionally, being underweight was not associated with fan increased risk of falling.
Key words: fall, BMI, underweight, obesity, central obesity

P1399

EXAMINE DAIRY INTAKE HABITS OF IRANIANS OVER 50: EMPHASIS ON FAT COMPOSITION

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Objective: The objective of this study was to examine dairy consumption patterns, with a focus on fat content, among Iranians aged 50 and older.
Methods: Data from participants over 50 years of age from the 2021 Iranian STEPS study (STEPwise approach to non-communicable disease risk factor surveillance) were used. Dairy products were categorized into three groups: low-fat (approximately 1.5% fat), high-fat (2.5 to 3% fat) and non-industrial/traditional dairy. Non-industrial dairy products do not usually undergo a defatting process, thus retaining their full fat content.
Results: A total of 10,883 participants were enrolled, of which 53.5% were women. The frequency of low-fat, high-fat, and traditional dairy product consumption was 40.3%, 24.1%, and 35.5%, respectively. The largest proportion of both males (39.5%) and females (40.9%) indicated they consumed low-fat dairy products. Most participants living in rural areas tended to consume traditional dairy products (60.9%), and most people living in urban areas tended to use low-fat dairy products (45.9%).
Conclusion: Considering rural residents' preference for traditional dairy products, it is essential to educate them about the potential health risks associated with these items. Emphasis should be placed on the benefits of switching to low-fat alternatives. Additionally, it is advisable to encourage the increased consumption of dairy products to help mitigate the risk of osteoporosis.
Key words: Dairy Products, Fat, Nutrition
Conflict of Interest: All authors declare that they have no conflicts of interest.

P1400

MITRAL AND AORTIC VALVE CALCIFICATIONS ASSOCIATED WITH HYPERCALCEMIA DIET AND CALCIUM SUPPLEMENTS

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Introduction:
There is a certain role regarding the association between the calcium supplementation and high calcium diet with cardiovascular calcifications, particularly with mitral and aortic valves. A systematic analysis of randomized controlled trials, cohort studies, observational studies and expertise opinions provides a different observations about the role of calcium on the vascular and bone health. Our date indicate that high intake of calcium supplements either dietary or calcium supplements are correlated with built-up calcium at mitral and aortic valves increase.
Material and Method:
Total of 56 female post-menopausal women with a history of high calcium diet or calcium supplements were analysed in open clinical randomized study compared with 62 control female individuals without this history in a group 2.The questionnaire about calcium and supplementation diet and transeoesophageal echocardiography with Doppler Ultrasound were the main method used in detection of heart valve calcifications. The exclusion criteria was other comorbidities like diabetes, chronic kidney disease and hyperparathyreoidism.
Results:
The results obtained in this study showed that all female patients with a history of high calcium intake either in a diet or supplements had increased heart valve calcifications. These calcifications were mainly detected as single heterogenic valve deposits especially in a mitral valve leaflets. The posterior mitral valve was mire affected that anterior one. The aortic valve in these patients were more diffuse. The average age of female patients was 63 years. The group 2 of investigated control individuas was 61 years old.
Conclusion:
High calcium intake either as a diet or calcium supplements contribute to ectopic calcifications where calcium is deposited in heart valves, particularly mitral valve is mainly affected. Adeqate magnesium and vitamin K2 intake may help regulate calcium metabolism in high cardiovascular risk patients.

P1401

HIGH-DOSE VITAMIN D THERAPY (300,000 IU MONTHLY): IMPLICATIONS FOR OSTEOARTHRITIS, OSTEOPOROSIS AND ARTERIAL STIFFNESS IN VITAMIN-D DEFICIENT PATIENTS

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Introduction:
Vitamin D deficiency is associated with skeletal disorders such as osteoarthritis (OA) and osteoporosis (OP), as well as non-skeletal conditions like arterial stiffness, a marker of cardiovascular health. The use of high-dose vitamin D therapy (300,000 IU monthly) has gained interest as an efficient means to correct deficiency and improve related health outcomes. In Osteoarthritis, high-dose regiemens may enhance anti-inflammatory effects. in Osteoporosis, clinical studies have shown improvements in lumbar spine and femoral neck BMD following high-dose vitamin D supplementation in deficient individuals. Vitamnin D may reduce arterial stiffness by modulating endothelial function, reducing vascular calcifications, improvement in pulse wave valve velocity and vascular compliance.

Material and Method:
The open prospective clinical study of 124 female patients suffering from Osteoarthrits and Osteoporosis, divided in a two groups by 62 each. The inclusion criteria was Vitamin D deficiency. Arterial stiffness was measured using Agedio device providing parameters from pulse wave velocity, central blood pressure, augmentation index, stroke volume etc. All. cardiovasular risk factors were included in a study and analysed accordingly. High-Dose Vitamin D Therapy (300,000 IU monthly) was applied intramuscularly and Vitamin D levels were measured one month later. Arterial stiffness was measured in all after one month accordinigly.
Results: The average age for Osteoarthritis group was 68,5 years and for Osteoporosis patients 66 years. The vascular age expressed as the value of arterial stiffness in Osteoarthritis group was app 5 years older than biological age. In Osteoporosis group this values wass 3 years difference. Vitamin D level in average was 16,7 ng/ml. After one month, following high dose Vitamin D application, the vitamin D level significantly increased to 24,5 ng/ml. Arterial stiffness was improved to 4 years in group I and to 3 years in group II respectively.
Conclusion: The high dose of vitamin D (300,000 monthly) is highly effective in a rapidly restoring adequate levels of 25-hydroxyvitamin D, particularly in individuals with severe deficiency. This regime has shown efficiency in achieving appropriate serum levels within one month. This improvement had a postive effectiveness on arterial stiffness in osteoarthritis and osteoporosis patients.

P1402

DO DIETS WITH GREATER INFLAMMATORY POTENTIAL INCREASE THE RISK OF DISABILITY IN BASIC ACTIVITIES OF DAILY LIVING IN OLDER PEOPLE?

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Objective: The aim of this study is to determine whether a diet with higher inflammatory potential; indicated by the highest tertile of Dietary Inflammatory Index (DII) score, is a risk factor for the incidence of disability in basic activities of daily living (BADL). Materials and Methods: This is a longitudinal incidence study with 1,777 participants from the *English Longitudinal Study of Ageing (ELSA)* aged 60 years or older and without difficulty to perform basic activities of daily living at baseline. The exposure studied was the inflammatory potential of the diet, measured by the DII and with the score divided into tertiles by sex, where the lowest tertile represents a lower inflammatory potential (men: ≤ 0.419; women: ≤ -0.375), the second tertile represents a moderate inflammatory potential (men: > 0.419 and ≤1.863; women: > -0.375 and ≤ 1.441) and the highest tertile represents a greater inflammatory potential of the diet (men: > 1.863; women: > 1.441). After two years of follow-up, performance in BADL using the adapted Katz scale was reassessed and then the incidence of disability in BADL was analysed using a Poisson regression model, controlled by socioeconomic, behavioural and clinical variables. Results: Participants with moderate dietary inflammatory potential had a 66% (RR = 1.66 95% CI 1.02 – 2.71) higher risk of developing disability in BADL than those with the least dietary inflammatory potential, while those with the highest dietary inflammatory potential had a 104% (RR = 2.04 95% CI 1.26 – 3.28) higher risk of developing disability in BADL than those with lower dietary inflammatory potential. Conclusion: The greater the inflammatory potential of the diet, the greater the risk of incidence of disability in BADL. Therefore, given that diet is a modifiable factor, it can be adjusted to decrease its inflammatory potential and, consequently, reduce the risk of disability in older people.

P1403

ANTIBODY GENERATION TO CERULOPLASMIN AS AN IMMUNOLOGIC MARKER IN SYSTEMIC LUPUS ERYTHEMATOSUS

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Ceruloplasmin is a copper-containing glycoprotein of blood plasma that is a component of the antioxidant system. In patients with various rheumatic diseases, including systemic lupus erythematosus (SLE), hyperproduction of active oxygen forms is found, in which a compensatory increase in the synthesis of antioxidants, including ceruloplasmin, that should inhibit oxygen free radicals, can be expected.
Objective: To determine antibodies to ceruloplasmin, to study their effect on the oxidase activity of ceruloplasmin, to determine the relationship of antibodies to ceruloplasmin with the activity of SLE.
Methods: Serum of 56 SLE patients and 30 practically healthy individuals was studied. Among SLE patients there were 52 women (93%) and 4 men (7%) at the age from 18 to 65 years. The activity of SLE was evaluated by SLEDAI-2K: 8 patients (14%) had minor activity, 25 (45%) had moderate activity, and 23 (41%) had high activity. The most of patients with SLE had subacute disease course (61%), the other patients - chronic (39%). The duration of the disease was from 6 months to 18 years. Antibodies to ceruloplasmin were determined by indirect ELISA, measured in units of optical density (u.o.d.).
Results: A group of patients with SLE had a significant increased content of antibodies to ceruloplasmin, which appeared at early stages of the disease and directly correlated with the degree of activity (r=0.436; p<0.005). Antibodies to ceruloplasmin were determined in 47% of patients. In this group of patients, the oxidase activity of ceruloplasmin did not significantly change depending on the activity (p>0.05). But in the group of SLE patients without

antibodies to ceruloplasmin, the oxidase activity was significantly higher than in patients with antibodies to ceruloplasmin. However, as SLEDAI-2K elevated, ceruloplasmin oxidase activity also increased. Thus, autoantibodies to ceruloplasmin have an effect on its oxidase activity by inhibiting it. The study of antibody synthesis to ceruloplasmin according to the course and duration of SLE did not find significant differences, that allows to use this marker in diagnostics of early stages.
Conclusion: In SLE there is an increase in the synthesis of autoantibodies to ceruloplasmin, as well as its enzymatic activity, which can be used as an additional criterion for the diagnosis of activity and prognosis in SLE.

P1404

CARDIOVASCULAR MANIFESTATIONS OF RHEUMATOID ARTHRITIS: ELASTIN ANTIBODIES

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Rheumatoid arthritis belongs to chronic autoimmune diseases, characterized by hyperplasia of synovial tissues, lesions of connective tissue and its derivatives, the structural protein component of which is elastin. However, elastin in large quantities is contained not only in the synovium, but also in the walls of blood vessels, valve apparatus of the heart. Autoantibodies to elastin lead to a disorder of its metabolism, respectively, to the generation of new antigens and synthesis of more antibodies, which then leads to chronic systemic inflammation, including vascular walls. This is one of the factors of cardiovascular pathology development.
Objective: To determine the level of autoantibodies to elastin in patients with rheumatoid arthritis, to reveal their correlation with cardiovascular manifestations in rheumatoid arthritis.
Methods: The study included 80 patients with rheumatoid arthritis (62 women (77.5%), 18 men (22.5%)), whose mean age was 49.6±12.8 years. The control group consisted of 30 conditionally healthy, comparable in sex and age. Moderate degree of activity was in 32 people (40%), low activity - in 12 (15%), high activity - in 36 (45%). According to the stages of the disease: 49 (61%) patients had advanced clinical stage, 31 (39%) - late stage. Some patients (55%) had extra-articular manifestations in addition to joint syndrome: skin, muscular, renal, and cardiac manifestations, among which myocarditis and pericarditis were registered. Among the manifestations of vascular lesions, vasculitis, including cerebral vasculitis, prevailed. Determination of the elastin antibody content was performed using indirect enzyme immunoassay method. The results were indicated in units of optical density (u.o.d.).
Results: Antibodies to elastin were detected in 31 patients (39%) with rheumatoid arthritis, and all of them had significantly high blood values of antibodies to elastin than the control group ($p<0,05$). Patients with extra-articular manifestations of rheumatoid arthritis in the form of cardiovascular pathology (17 patients, 21.25%) were characterized by increased levels of autoantibodies to elastin (0.112±0.108 e.o.p.) compared to the control group ($p<0.05$).) as against both the control group (0.050±0.027 e.o.p.; $p<0.001$) and in comparison with patients without extra-articular manifestations of arthritis (0.054±0.062) and with other systemic manifestations excluding vasculopathies (0.054±0.032 e.o.p. and 0.076±0.108 e.o.p., respectively; $p<0.005$).
Conclusion: Increased synthesis of autoantibodies to elastin as a component of the vascular wall may be a cause of systemic vasculopathy and, as a result, a factor in the development of early atherosclerosis, as well as a marker of systemic cardiovascular appearances of rheumatoid arthritis.

P1405

CHANGES IN HEMATOLOGIC PARAMETERS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Introduction: Rheumatoid arthritis (RA) is a chronic immunoinflammatory disease characterized by both erosive arthritis and systemic involvement of internal organs. At the same time extra-articular manifestations from the blood system can occur in the course of the disease or against the background of its drug therapy, aggravating the course of RA and complicating the adequate therapy.
Objective: To identify changes in hematologic parameters in RA patients, their possible connection with the course and peculiarities of clinical manifestations of the disease.
Methods: 30 RA patients participated in the study. Exclusion criteria were the presence of hematologic and nephrologic pathologies. Laboratory data of the patients were evaluated: erythrocytes, hemoglobin, color index, leukocytes, neutrophils, eosinophils, lymphocytes, monocytes, thrombocytes, ESR. Statistical processing of the obtained data was carried out in the program "Microsoft Excel 2010" using the methods of descriptive statistics.
Results: There were 8 (26.7%) males and 22 (73.3%) females among the subjects. The mean age of the patients was 57.03±14.35 years, and the disease history ranged from 6 months to 20 years. 26 (86.7%) patients had high disease activity and the rest (13.3%) had moderate disease activity. 18 (60%) patients were seropositive. All patients were receiving baseline anti-inflammatory drugs. The mean erythrocyte concentration was 4.18±0.58^10^{12}/L and hemoglobin was 120.00±15.81 g/L. Mild anemia was registered in 11 (36.7%) patients and moderate anemia in 1 (3.3%) patient. Leukocyte count in all patients was within the reference values (7.02±2.33^10^{9}/L), no abnormalities in leukoformulas were registered. Moderate thrombocytopenia (128.03±16.78^10^{9}/L) was detected in 3 (10%) patients. Elevation of ESR and CRP was recorded in 25 (83.3%) patients (42.30±14.65 mm/h) and 24 (80%)

patients (24.73±15.32 mg/L), respectively. Correlation analysis showed a negative relationship between hemoglobin concentration and CRP level (r=-0.32), as well as with DAS28-CRP(4) (r=-0.34), duration of RA (r=-0.12), and duration of high-dose methotrexate intake (r=-0.18). There was also a correlation between platelet count and RA activity: ESR (r=0.25), CRP (r=0.14).
Conclusion: Thus, one third of patients with RA have hematopoiesis disorders in the form of anemic syndrome, which may be due to both the disease activity and the side effect of baseline anti-inflammatory drugs (methotrexate, leflunomide). Detected cases of thrombocytopenia may also be associated with the use of baseline anti-inflammatory drugs. Therefore, regular hematologic monitoring is necessary in the treatment and monitoring of patients with RA and, if necessary, timely and adequate correction of the resulting disorders.

P1406

RESISTIN AS A MARKER OF METABOLIC SYNDROME IN PSORIATIC ARTHRITIS PATIENTS

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Objective: To consider resistin as a novel serum biomarker for monitoring the risk of metabolic syndrome in patients with psoriatic arthritis (PsA).
Methods: Data from clinical trials were searched in the databases of PubMed, Google Scholar. The association of resistin with clinical and laboratory manifestations of PsA and concomitant pathology was studied.
Results: Patients with PsA have a high risk of complications associated with the metabolic syndrome (obesity, dyslipidemia, diabetes mellitus or insulin resistance) and cardiovascular disease. Chronic inflammation in PsA partially explains the development of atherosclerosis and cardiovascular disease. Adipokines are involved in the regulation of various processes such as lipid or glucose metabolism as well as inflammation. Among the adipokines with pro-inflammatory effects, patients with PsA have significantly higher levels of resistin than those without PsA (Oguz Dikbas, 2014; Dikbas O., 2016). Sofia Makishi Schlenker et al. showed associations of resistin with insulin resistance (p=0.008) and metabolic syndrome (p=0.01), correlations with total cholesterol (r=0.26) and triglycerides (r=0.33). All key studies proved the role of resistin in the development of insulin resistance. No correlation was found with disease activity, DAPSA index. High levels of resistin correlate with body mass index. Trang Nguyen-Mai Huynh et al described the association of resistin with non-calcified atherosclerosis. Resistin is able to induce IL-6, TNF-α and IL-1β production by peripheral blood mononuclear cells.
Conclusion: Resistin is associated with coronary artery disease and may be a marker of coronary atherosclerosis progression in patients with PsA. Also, resistin may be considered as a marker of metabolic syndrome in PsA. Resistin contributes to the development of insulin resistance and mild inflammation. Therefore, further study of resistin is required in order to introduce it into clinical practice.

P1407

THE ROLE OF ADIPOKINES IN THE DEVELOPMENT OF METABOLIC SYNDROME

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Objective: To study and summarize the data on the role of adipokines (apelin, resistin, visfatin) in the development of metabolic syndrome.
Methods: PubMed Central, Google Scholar data were analyzed.
Results: Data from studies based on the determination of plasma concentrations of apelin, resistin, and visfatin in patients with cardiovascular pathology and obesity have been accumulating over the past decades.
Apelin-13 is considered the most active form of this cardiovascular adipokine, where it exhibits positive inotropic and vasodilatory effects by increasing nitric oxide production. Thus, apelin plays an important role in blood pressure regulation, may influence some immune cells and has proangiogenic properties. In metabolic syndrome, apelin has a favorable effect on insulin sensitivity, associated with effects on both glucose metabolism and lipid metabolism. The associated antidiabetic and antiatherosclerotic effects suggest that apelin may be a promising target in the study and treatment of metabolic diseases.
Resistin is a hormone produced by adipocytes that has been linked to obesity and type 2 diabetes mellitus. Resistin is thought to be a molecular factor linking obesity and diabetes mellitus. It is also reported that resistin plays an important role in inflammation, either directly or through various cytokines such as interleukin 6, tumor necrosis factor α, which may regulate resistin gene expression. Resistin decreases endothelial nitric oxide synthase expression in human coronary artery endothelial cells and stimulates vascular smooth cell migration, thereby causing pathologic changes in the vessels.
Visfatin is a hormone whose plasma concentration is directly related to the development of type 2 diabetes mellitus. This biomarker is expressed mainly by visceral adipose tissue. Visfatin is involved in the regulation of cell proliferation, glucose and lipid metabolism. Visfatin levels are associated with insulin resistance, which may suggest its role in the development of cardiometabolic risk.
Conclusion: Thus, apelin and visfatin may exert favorable effects in diabetes, while resistin exhibits opposite effects, which may lead to vascular lesions such as atherosclerosis. Overall, this topic is relatively new and still poorly understood, requiring additional experimental studies.

P1408

IMPACT OF HYPOBARIC HYPOXIA ON BONE MICRO-ARCHITECTURE AND MINERAL CONTENT IN MALE SPRAGUE DAWLEY RATS

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Objective: To study the impact of hypobaric hypoxia on bone micro-architecture and mineral balance.
Material & Method: Male Sprague Dawley (SD) rats (n=6) weighing 300±25g were divided into two groups: Hypobaric hypoxia and Normoxia. 3 Male SD rats were exposed to an altitude of 25,000ft for 35 days in a decompressor chamber, while other three rats were housed at sea-level and sacrificed at day 0. The decompression chamber was opened daily once to facilitate food and water replacement and to measure body weight. After completion of the exposure, rats were sacrificed, and bones (femur & tibia) were collected to analyze micro-architectural changes and alterations in mineral composition.
Result: The results indicated a reduction in body-weight by 25% in hypobaric hypoxia-exposed rats. The micro-architecture analysis through micro-CT in the femur revealed a significant 62% reduction in bone volume and a 69% reduction in the bone surface. Additionally, a 65% reduction in trabecular numbers with an increase in trabecular spacing by 68% at distal metaphysis was observed compared to normoxia rats. Moreover, in tibia a 91% reduction in bone volume and an 88% reduction in bone surface was observed. An 87% reduction in trabecular numbers with an increase in trabecular spacing by 89% was observed. The mineral content evaluation using ICP-MS indicated significant reductions in key minerals like calcium, magnesium and phosphorus by 38%, 22%, and 36%, respectively in femur, and 26%, 32%, and 12%, respectively, in tibia compared to normoxia, signifying impaired bone mineral balance.
Conclusion: The study indicates a pronounced loss in both the tibia and femur; notably, the bone loss was higher in the tibia. The depletion of essential minerals indicating compromised bone mineralization that may increase fracture risk under chronic hypobaric hypoxia. These findings shed light on the adverse effects of high-altitude conditions on bone health and emphasize the need for interventions to mitigate bone deterioration at high altitudes.
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P1410

TUMOR-INDUCED OSTEOMALACIA: DATA FROM A GREEK COHORT

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Objectives: The presentation of tumor-induced ostemalacia (TIO) patient characteristics from a greek cohort.
Material and Methods: Case series of patients diagnosed with TIO in greek reference centers.
Results:

- Seven cases are presented in total.
- Three patients were male and four female. They were mostly middle-aged (45-60 years0, although one case was 25 years old and another was 79 years old.
- All patients presented with muscle weakness, abnormal gait and fatigue. All of them had suffrered insufficiency fractures and had a low bone mineral density.
- All patients had hypophosphatemia with phosphaturia and increased serum fibroblast growth factor 23 (FGF23).
- The responsible tumor was located in all cases except for one. Both functional (68Ga DOTATOC PET/CT ή/και 18-F FDG PET/CT) and anatomic imaging (localized or whole-body CT ή/και MRI) were used.
- Total surgical excision in wide margins was possible in only four cases. One case had a non-excisable sinonasal tumor, another had a non-excisable osseus tumor and in a third case the responsible tumor could not be detected.
- The respective biopsies suggested benign tumors, with the

exception of one case who had a malignant tumor (malignant histiocytoma). Histological types included: 1) giant cell tumor of tendon sheaths, 2) solitary fibrous tumor/hemangiopericytoma, 3) phosphaturic mesenchymal tumor, 4) glomangiopericytoma.
- All cases received a conventional supplementary treatment with alfacalcidol and phosphate salts. Two cases received burosumab in the recommended dosage and an intensified regimen was required in one case to reverse hypophospatemia.
- In all cases, medical and surgical treatment led to the amelioration of clinical manifestations, to the stabilisation of serum phosphate and to an increase of bone mineral density.

Conclusions: These are the first data to be published from a greek cohort of TIO patients. The cases are characteristic and in coherence with the international literature.

P1411

SERUM SCLEROSTIN IS ASSOCIATED WITH ACPA POSITIVITY IN POST-MENOPAUSAL WOMEN WITH RHEUMATOID ARTHRITIS

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Objectives

The role of sclerostin in rheumatoid arthritis (RA) is controversial. Study results show a beneficial action against inflammation in the articular microenvironment and a detrimental role in systemic bone loss (1). Anti-citrullinated protein antibodies (ACPA) promote RANKL-mediated bone absorption in RA patients (2).

Materials and methods

A cross-sectional study in a RA cohort of post-menopausal women in a greek tertiary hospital. Patients underwent clinical evaluation to record disease characteristics. Whole-body dual-energy X-ray absorptiometry (DEXA) was used to calculate bone mineral density (BMD) and appendicular skeletal muscle mass (ASMI). Serum samples were collected to calculate serum sclerostin, parameters of inflammation and parameters of bone metabolism. Osteoporosis was defined according to the national recommendations by the Hellenic Society for the Study of Bone Metabolism (HSSBM).

Results

In total, 97 RA patients were enrolled. Patients' mean age was 67 ± 7 years and mean BMI was 29 ± 5 kg/m^2. Median disease duration was 8 (1-10) years and 40% had seropositive disease. All the patients were under treatment (65% under biotherapy). The mean DAS28-ESR score was 3.8 ± 1.7 and 27% were in disease remission. The majority (80%) suffered from osteoporosis, 38% reported at least one fragility fracture and 48% were receiving anti-osteoporotic treatments at the time of enrolment. Median serum sclerostin was 1.5 pg/ml and it was only associated with the positivity of ACPA (p=0.043).

Conclusion

Serum sclerostin is associated with positivity of ACPA in rheumatoid arthritis suggesting a possible pathophysiological role of the latter in systemic bone loss mediated through the direct inhibition of the Wnt signalling pathway.

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P1412

THE LONG-TERM IMPACT ON BONE MINERAL DENSITY OF SWITCHING FROM 24-MONTH DAILY TERIPARATIDE TO DENOSUMAB OR ZOLEDRONIC ACID IN POSTMENOPAUSAL OSTEOPOROSIS

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Objectives: Comparison of the effects on bone mineral density (BMD) after switching from a 24-month course of daily teriparatide (TPTD) to either Denosumab (Dmab) or intravenous (iv) Zoledronic acid (ZOL) in patients with postmenopausal osteoporosis.
Material and Methods: We retrospectively analyzed 49 postmenopausal women at our outpatient clinic who had previously received 24 months of teriparatide (20μg/d) for severe osteoporosis, followed by either Dmab 60mg (n=28) or iv ZOL 5mg (n=21), along with daily vitamin D and calcium, according to each physician's decision. Lumbar spine (LS) and total hip (TH) bone densitometry were performed at 0, 12, 24, and 36 months. Analyses

were performed using t-tests, and statistical significance was set at p<0.05.

Results: No significant differences were found between the two groups in baseline characteristics such as mean age, BMI, years since menopause, and prior antiosteoporotic treatment. Baseline LS and TH BMD were also similar between groups (LS: 0.823±0.15 vs 0.841±0.11, p: 0.651; TH: 0.746±0.11 vs 0.707±0.06, p: 0.141). At 36 months, patients receiving Dmab showed significantly larger BMD increases across all evaluated skeletal sites compared to those on ZOL (ΔBMD_{LS}=0.079±0.06 vs. 0.013±0.03, p<0.001; ΔBMD_{FN}=0.088±0.06 vs. 0.022±0.03, p<0.001). After 36 months, the BMD gain was significantly higher in the Dmab group compared to the ZOL group: LS (10.25 vs. 1.83 %; P < 0.001) and TH (12.35 vs. 3.28 %; P < 0.001) (Figure 1).

Conclusion:

Switching from 24 months of daily TPTD to Dmab vs. ZOL for 36 months is more effective in terms of BMD increase at both the LS and the hip.

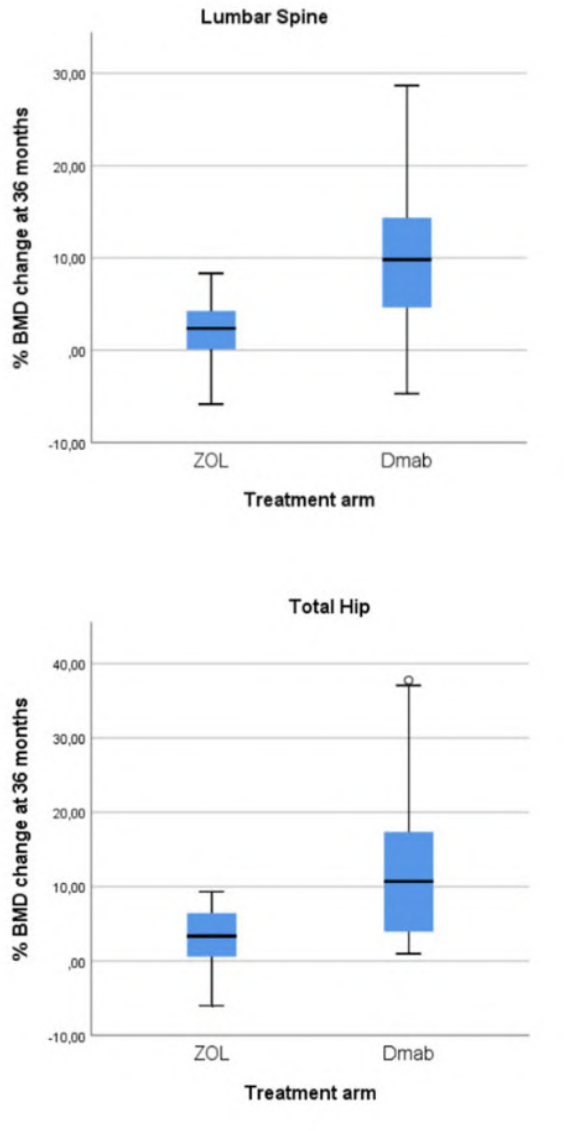

***Figure 1:** % BMD change in LS and TH at 36 months*

P1413

TREATMENT OF VANCOUVER B1 PERIPROSTHETIC FRACTURES WITH A CONTRALATERAL REVERSED FEMORAL LISS PLATE: CLINICAL EXPERIENCE AND RESULTS

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OBJECTIVES

To present a series of cases on a specific surgical technique for the treatment of Vancouver B1 periprosthetic fractures, using a contralateral and inverted femoral Liss plate.

MATERIAL AND METHODS

Retrospective study of all patients treated with inverted Liss plate (Synthes) fixation in our department (2015 to 2020). Variables: demographics, pathology and type of fracture, laterality, type of surgery, plate size, number of screws and screw-plate ratio, elastic or rigid mounting, use of cerclages and other systems, surgical time, intra- and postoperative complications, transfusion rate, days of hospitalization, follow-up at one month and one year, consolidation time and death.

RESULTS

29 patients (30 femurs, 59% right), mean age 84 years (39-96), of which 72.5% women. 25 Vancouver B1 periprosthetic fractures (22 on total hip prostheses and 3 on partial hip prostheses), 4 on femur fractures with total knee prostheses to achieve overlapping (3 subcapital and 1 pertrochanteric) and 1 femur pseudoarthrosis. Contralateral inverted Liss plates were used, 15 with 15 holes, 14 with 13 holes and 1 with 17 holes; elastic synthesis was achieved in 85%. In 23.3% the LAP plate and cerclages were added to the fixation. Mean surgical time 144 minutes, with a transfusion rate of 70% and a mean hospital stay of 13 days. Intraoperative complications, 2 material mobilizations (reoperated during admission), 1 intraoperative death and 1 bleeding from surgical wound. 2 infections during follow-up, surgically washed (one of them we performed re-osteosynthesis) and 2 constant thigh pains (removal of osteosynthesis material). 90% of the indications were consolidated, most of them within 5 months. 50% were walking one year after the consultation. And the death rate was 58%.

CONCLUSIONS

Due to the increase in the life expectancy of the population and the increase in the implantation of hip prostheses, the incidence of periprosthetic femur fractures is increasing. There are many therapeutic options, depending on the type of fracture, prosthetic stability and comorbidities of the patient. The use of contralateral inverted femoral Liss plates in Vancouver type B1 fractures has proven to be a good treatment alternative with a consolidation rate and results similar to those present in the current literature and comparable to those obtained with specific anatomical plates.

P1414

MINIMALLY INVASIVE LOCKING PLATE FOR PROXIMAL HUMERUS FRACTURES: RESULTS IN A THIRD LEVEL HOSPITAL

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OBJECTIVES:
The results obtained after surgical treatment with a minimally invasive polyaxial locking plate (MIPO) are analyzed and compared with the current literature.
MATERIAL AND METHODS:
Retrospective study of all patients treated for proximal humerus fracture using the MIPO technique (NCB-PH or PHILOS) from January 2013 to December 2020. Variables analyzed: demographics, classification (Neer), surgical time, joint balance, VAS, DASH and Constant scales (at 1 month, 3 months, 6 months and 1 year) and surgical complications. Minimum follow-up 1 year.
RESULTS:
80 patients with a mean age of 68 years (21-86) were included, of which 75% were women. 20 cases were Neer type II, 50 type III and 10 type IV. The most commonly used implant was NCB-PH (55.6%), requiring a cancellous graft in 14 patients. The surgical time was 75 minutes (75 +- 11.58). 21.4% of patients had some complication, including 5 stiffnesses, 4 necrosis and 3 material removals. The mean decrease in the DASH scale one year after the fracture was 0.15 points. The mean value of the VAS scale one month after surgery was 4.17 (3.48-4.85), at three months it was 2.91 (2.20-3.62) and at six months it was 2.51 (1.78-3.23). The mean value of the Constant scale at three months was 62.88 (58.38-67.38) and at six months 71.38 (66.59-76.18). Postoperative mobility was maintained in the middle segment (40-60% of the contralateral) in terms of anteflexion, abduction, and rotations during the first month, with the upper segment (80-100%) being reached by 65% of patients at the end of the follow-up.
CONCLUSIONS
Proximal humerus fractures are a challenge for the orthopedic surgeon, since the "Gold Standard" continues to be conservative treatment. Several meta-analyses agree on the need to conduct studies that provide sufficient evidence. Osteosynthesis with plates and screws is a therapeutic option in the treatment of fractures of the proximal end of the humerus, with good clinical results, although not without complications and whose indications are yet to be defined. The results obtained are similar to those present in the current literature.

P1415

USE OF LOCKED INTRAMEDULLARY NAIL FOR PROXIMAL HUMERUS FRACTURES. EXPERIENCE IN A THIRD LEVEL HOSPITAL

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OBJECTIVES:
The objective is to analyze the functional and radiological results of the use of the intramedullary nail for the treatment of proximal humerus fractures.
MATERIAL AND METHODS:
Descriptive-retrospective study of all patients with proximal humerus fractures treated with Multiloc endomedullary nail (Synthes) using a minimally invasive approach in our hospital from 2018-2022. Variables: demographic (sex, age), laterality, type of fracture according to NEER, surgical time, hospitalization time, rate of consolidation, pain scales (VAS), functionality (Constant score and ASES questionnaire) with a minimum follow-up of 1 year and complications.
RESULTS:
30 patients, 21 women and 9 men, with a mean age of 58 years (42-68), presented a displaced proximal humerus fracture in two fragments (18), in three (10) and in four (2) according to NEER. With right dominance (63%). The mean surgical time was 75 minutes (58-110), with a mean hospitalization of 3 days (1-5). The mean time to consolidation observed in radiography was 4 months (100% of cases). An anatomical cervicodiaphyseal angle was obtained in 90% at one year, with a mean of 128 (133)º. We had a 16% of complications, 2 avascular necrosis of the head, two varus collapses of the fracture and 1 infection. At twelve months of follow-up, we obtained a mean joint balance in flexion of 139º ± 30, abduction 145º ± 25, external rotation to the ipsilateral ear and internal rotation to L5; a mean score on the Constant scale of 74 ± 10 and on the ASES scale 83 ± 7 and the resulting VAS was 2 ± 1.5. Better results with less severity on the NEER scale.
CONCLUSIONS:
The choice of implant for the treatment of surgical displaced proximal humerus fractures is one of the keys to clinical, functional and radiographic success, however it is a matter of controversy. After the results obtained, in terms of healing rate, functional and radiographic results and the low rate of complications, we consider medullary nailing to be effective as a treatment for displaced proximal humerus fractures, if we compare it with other therapeutic approaches. However, comparative studies with other techniques are necessary to evaluate the results.

P1416

SUPRAPATELLAR OR INFRAPATELLAR TIBIA MEDULLARY NAILING? DESCRIPTIVE ANALYSIS OF THE RESULTS OBTAINED IN OUR CENTER

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OBJECTIVES:
To analyze the clinical and radiological results obtained from the use of the suprapatellar approach in tibial fractures treated with an intramedullary nail. To analyze advantages, indications, and comparison with the infrapatellar approach.

MATERIAL AND METHODS
Retrospective longitudinal studies of all tibial fractures treated in our hospital with an intramedullary nail via the suprapatellar approach from 2018-2022.
Variables: demographics, type of fracture, radiological results, surgical time, and complications. Minimum follow-up of one year. Comparison with fractures treated via the infrapatellar approach as a control group.

RESULTS
22 patients in the case group (64% men) and 20 patients in the control group (60% women).
In the cases: 18 distal metaphyseal fractures with fibula fracture and 4 proximal fractures.
In the controls: 14 distal metaphyseal fractures with fibula fracture and 6 proximal metaphyseal fractures.
Average surgical time: 85 minutes in cases and 110 in controls.
Radiological result of cases: 15 correct reduction in axis, 5 had 4-5º residual valgus and 2 had 4-5º recurvatum.
Radiological result of controls: 8 correct reduction in axis, 7 had 4-5º residual valgus and 5 had 3-4º recurvatum.
Complications in cases (27%): 3 dynamization of the bald spot, 1 axonotmesis of the external popliteal sciatic nerve, and 2 postoperative gonalgias.
Complications in controls (40%): 4 dynamization of the nail, 1 hypertrophic pseudoarthrosis and 3 postoperative gonalgias.
Functional results ICKD scale at one year: cases 89 vs controls 72. According to Lyscholm scale 85 in cases vs 77 controls

CONCLUSION
With a good indication the suprapatellar approach is a good alternative for the treatment of tibia fractures. It has certain advantages in relation to other approaches described in the literature: in fractures of the proximal third of the tibia, the insertion of the entry point is easier, in more distal fractures it simplifies the freehand locking in different planes and if a fibula fracture is associated, its reduction and synthesis is simpler, there is less post-surgical gonalgia, less surgical time, technical ease and comfort for the surgeon. The rate of complications is similar in both approaches.

P1417

OSTEOPOROSIS IN TURNER SYNDROME ASSESSED WITH RADIOFREQUENCY ECHOGRAPHIC MULTI-SPECTROMETRY (REMS)

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Objective:
Turner syndrome, a chromosomal disorder, is often associated with osteoporosis due to estrogen deficiency and abnormal bone remodeling. This case report investigates the use of Radiofrequency Echographic Multi-Spectrometry (REMS) to assess bone fragility and fracture risk in a patient with Turner syndrome (45,X iso Xq).
Material and Methods:
A 45-year-old female with Turner syndrome was evaluated using REMS at the lumbar spine and both femora. REMS scans were performed with the EchoStudio device (Echolight S.p.a., Lecce, Italy) using a 3.5 MHz convex transducer. Lumbar spine scans were conducted trans-abdominally under the sternum, visualizing L1 to L4, with 20 seconds per vertebra. Proximal femur scans were done by positioning the transducer parallel to the femoral head-neck axis for 40 seconds. The REMS system generated a patient-specific spectrum to calculate bone mineral density (BMD), T-scores, and the fragility score (FS), which ranges from 0 to 100 to assess bone fragility independently of BMD. The FS provides an overall risk for major osteoporotic fractures (MOF) over the next 5 years.
Results:
The patient, on estrogen replacement therapy and vitamin D supplementation, had a prior history of left tibia fracture. Physical examination confirmed Turner syndrome, and DXA scans showed osteopenia in the lumbar spine (-2.3 SD) and femur (-2.4 SD). REMS revealed a lumbar spine T-score of -2.2 SD (osteopenic range), left hip T-score of -2.5 SD (osteoporotic range), and right hip T-score of -2.4 SD (osteopenic range). The FS was 52.3, placing her in the R6 category, indicating a high fracture risk for MOF over the next 5 years.
Conclusions:
This case highlights the value of REMS in assessing bone quality and fracture risk in Turner syndrome. Although DXA showed osteopenia, the higher FS indicated significant bone fragility and a high fracture risk, suggesting the need for more aggressive osteoporosis management. REMS provides crucial additional information that can guide treatment decisions for osteoporosis in Turner syndrome patients.
Key Words: Turner syndrome, osteoporosis, fragility score, REMS, bone mineral density

P1418

OBESITY-DRIVEN MOLECULAR ENDOTYPES OF SYNOVIAL FIBROBLASTS SHAPE INFLAMMATORY PROFILES IN OSTEOARTHRITIS

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Objective

Increasing evidence supports the role of joint inflammation in osteoarthritis (OA) cartilage damage and joint pain (1-2). Our research has highlighted the central role of synovial fibroblasts (SFs) in mediating OA joint inflammation (3), particularly in patients who are obese (4). This study (5) characterised the obesity-associated inflammatory phenotype of SFs and defined molecular endotypes by examining transcriptomic, metabolic, and inflammatory SF profiles from different OA joints, including both load-bearing and non-load-bearing sites, in patients who were either of normal-weight or obese.

Materials and Methods

Synovium was collected from OA patients (n=32) undergoing joint replacement surgery (UK NRES 16/SS/0172), stratified by BMI into obese (BMI >30) and normal weight (BMI 18.5–24.9). SFs were isolated and characterised using targeted proteomics (Olink), metabolic flux assays, bulk RNA sequencing, and single-cell RNA sequencing (scRNAseq). Inflammatory mediator expression was validated by Luminex assays, and immunohistochemistry performed by Vectra.

Results

Targeted proteomic, metabolic and transcriptomic analysis found the inflammatory landscape of OA SFs are independently impacted by obesity, joint loading and anatomical site with significant heterogeneity between obese and normal weight. scRNAseq further defined four molecular endotypes: "activated fibroblasts", "immune cell recruiters", "proliferative fibroblasts", and "stressed/arresting fibroblasts". Notably, the inflammatory fibroblast endotypes were predominant in OA patients with obesity, which in contrast to normal-weight SF subsets, were characterised by upregulated CXCL12, CFD and CHI3L1 expression, and spatially localized to both lining and sublining synovial layers distinguished by the differential expression of MYC and FOS.

Conclusion

This study demonstrates that obesity influences the inflammatory landscape of synovial fibroblasts in both load-bearing and non-load-bearing joint types, likely contributing to OA pathogenesis through distinct molecular endotypes. The identification of these obese fibroblast subsets provides a framework for stratifying OA patients and the rationale for therapeutically targeting specific fibroblast subset pathotypes.

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P1419

RUFY4 DEFICIENCY IN OSTEOCLASTS ENHANCES BONE MASS VIA IMPAIRED CATHEPSIN K SECRETION AND PERIOSTIN DEGRADATION

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Objective(s) This study aims to elucidate the osteoclast-specific role of RUN and FYVE domain-containing protein 4 (RUFY4) in bone remodeling.

Material and Methods We generated osteoclast-specific *Rufy4* knockout mice (*Ctsk*$^{Cre/+}$; *Rufy4*$^{fl/fl}$; hereafter referred as *Rufy4*$^{\Delta 0c/\Delta 0c}$) using the Cre-loxP system. Trabecular and cortical bone parameters were evaluated via micro-CT. Osteoclast formation and activity were assessed by TRAP staining of bone sections. Bone marrow-derived macrophages were differentiated into mature osteoclasts *in vitro* and subjected to resorption pit assays and c-telopeptide of type I collagen (CTX-1) ELISA. Lysosomal trafficking and the distribution of cathepsin K and periostin were visualized using immunofluorescence staining. Supernatants from mature osteoclast cultures were assessed for active cathepsin K and degraded periostin secretion via immunoblotting.

Results *Rufy4*$^{\Delta 0c/\Delta 0c}$ mice showed significantly increased trabecular bone mass and cortical bone volume *in vivo*, with lower CTX-1 and higher periostin levels. *In vitro*, these mice showed impaired bone resorption activity, as evidenced by reduced resorption pits, CTX-1 levels, and cathepsin K release into the extracellular space, despite normal osteoclast differentiation. Immunofluorescence analyses revealed disrupted lysosomal trafficking and periostin accumulation within osteoclasts, along with impaired periostin degradation in the absence of RUFY4.

Conclusion(s) RUFY4 plays a critical role in bone remodeling by regulating CTSK secretion and Postn degradation in osteoclasts. These findings suggest that targeting RUFY4-mediated pathways could provide therapeutic strategies for bone diseases characterized by excessive resorption.

P1420

APPLICATION OF THE FRAX ALGORITHM FOR SCREENING OSTEOPOROSIS AMONG PATIENTS OF MULTIDISCIPLINARY HOSPITALS

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Background: Osteoporosis is the most common chronic metabolic bone disease characterized by a decrease in their mineral density, which subsequently leads to an increased risk of low-energy fractures in people over 50 years of age. One of the criteria for establishing a diagnosis and starting therapy is a high risk according to FRAX. The use of this algorithm is a simple method that does not require the use of special diagnostic equipment and laboratory tests.

The aim: to assess the prevalence of osteoporosis and osteoporotic fractures among patients of multidisciplinary hospitals using the FRAX calculator.

Materials and methods: The study involved 300 patients aged from 50 to 91 years, the average age was 68 [60.75; 76] years, men - 125 people with an average age of 64 [59; 70] years, women - 175 people with an average age of 70 [64; 80] years. Patients gave voluntary consent to participate in the study. The patients were surveyed using a specialized questionnaire. The patients were assessed for the presence of concomitant pathology that significantly affects of bone mineral density - diabetes mellitus, rheumatoid arthritis, chronic heart failure. The risk of osteoporosis and osteoporotic fractures was assessed using the FRAX online calculator. The risk of major osteoporotic fractures was assessed as high if the indicator was above the threshold of therapeutic intervention; a fixed value of more than 3% was used to assess the risk of hip fracture. Statistical data processing was performed using GraphPad Prism v8.02. Taking into account the distribution of features that differed from normal, correlation analysis was performed using Spearman's rank correlation and γ-correlation in the case of establishing relationships between qualitative and quantitative indicators. The dependence of relative indicators was assessed by constructing four-field contingency tables using the Pearson $\chi 2$ criterion, the odds ratio. Differences between groups were considered reliable at $p<0.05$.

Results: All patients were divided into groups: Group 1 - 50-59 years old, which included 31 women (10.33%) and 37 men (12.33%); 2 group 60-69 years old, which included 55 women (18.33%) and 44 men (14.67%); 3 group 70 years and older, which included 89 women (29.67%) and 44 men (14.67%). In terms of the frequency of comorbid pathology among women and men of all groups, chronic heart failure prevails. Thus, 42 (33.6%) men and 89 (50.1%) women had chronic heart failure. Diabetes mellitus type 1 and 2 and rheumatoid arthritis were also common among women: 40 (22.9%) and 21 (12%) cases, respectively. Among men, diabetes mellitus and rheumatoid arthritis are much less common, 7 (5.6%) and 4 (3.2%) cases, respectively, $p <0.05$. The main risk factors for osteoporosis that were identified in the examined patients were distributed as follows: 27 (21.6%) men and 66 (37.7%) women had a burdened family history of hip fracture in their parents. More than half of the men in all groups are smokers - 64 people (51.2%), but only 22 (12.6%) women were current smokers. Oral glucocorticoids for more than 3 months at a dose of 5 mg of prednisolone and more were taken by 2 (1.6%) men and 11 (6.3%) women. In the studied groups, fractures due to low-energy falls or spontaneously did not occur in the first group, they were revealed as a result of questioning in 17 patients of the second group (17.17%) and 42 (31.58%) of the third group. It was found that in the second group 11.1% of fractures and 24.8% of fractures in the third group occurred in women. Thus, the incidence of fractures among women was 2.58 times higher than that of men ($p<0.01$). The majority of fractures occurred in the femoral neck, 9 (60%) cases in men and 31 (70.5%) in women, as well as in the distal forearm, 4 (26.7%) cases in men and 10 (22.7%) in women. In each group, the risk of osteoporotic fractures was assessed according to FRAX, and patients with an osteoporotic fracture risk above the intervention threshold were identified. Thus, when assessing the risk of osteoporotic fractures according to FRAX, it was found that in the first group, 2 women (2.94%) had an increased risk of osteoporotic fracture. In the second group, patients with an increased risk of osteoporotic fracture amounted to 14 women (14.14%). In the third group, an increased risk of osteoporotic fracture was observed in 33 patients (24.81%), of whom 32 were women (24.06%) and 1 man (0.75%). When assessing the risk of hip fracture in the first group, no patients with a high risk of hip fracture were identified. In the second group, an increased risk of osteoporotic fracture was observed in 33 patients (24.81%), of whom 32 were women (24.06%) and 1 man (0.75%). When assessing the risk of hip fracture in the first group, no patients with a high risk of hip fracture were identified.

Conclusion: It was established that 19.33% of patients in somatic hospitals received low-energy fractures. Among the patients, the largest proportion is women aged 60 to 91 years. At the same time, an increased risk of osteoporotic fracture and hip fracture was also observed mainly in women aged 60 to 91 years. 34% of patients in somatic hospitals need drug treatment for osteoporosis.

P1421

OLDER PATIENTS WITH OSTEOPOROSIS AND CHRONIC KIDNEY DISEASE-MINERAL AND BONE DISORDER (CKD-MBD): A SERIES OF CHALLENGING CASES

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Objective:
The prevalence of osteoporosis (OP) and chronic kidney disease (CKD) increases with age, significantly affecting health and posing a societal burden. While OP management is well-defined in guidelines, treatment decisions in cases with CKD-mineral and bone disorder (MBD) remain challenging. We will present a series of cases evaluated for OP and CKD-mineral and bone disorder (MBD) by Istanbul Musculoskeletal Health Consortium.

Participants and Methods:
Cases managed between December 2023-December 2024 were analyzed. Routine tests, including eGFR, serum calcium, phosphorus, albumin, PTH, ALP, 25-OH vitamin D levels, DXA T-scores, were documented. FRAX tool components, geriatric syndromes, comorbidities, and sociodemographic data were assessed. CKD-MBD was diagnosed based on biochemical findings, with no bone biopsies performed.

Results:
The study included 20 participants (mean age,77.4; female,50.0%). Mean eGFR,31.9 mL/min/1.73m², with 2 patients on dialysis. Fragility fracture history was present in 65.0%(13 patients;3 hip, 8 vertebra and 2 both), but only 15.3% were on current OP treatment. The diagnosis were made OP-only in 50.0%, while the other 50.0% had OP+CKD-MBD (10 patients: 7 adynamic bone disease [ABD], 3 osteomalacia [OM]). All 7 ABD patients were discontinued calcium and Vitamin D supplements, and/or started phosphorus binders. After biochemical correction, 71.4%(5/7) were started teriparatide, 1(14.2%) denosumab, one followed without treatment due to to low FRAX scores (shared-decision with the patient). After vitamin D replacement, 2 of 3 CKD-MBD (OM) patients (66.7%) received denosumab, and 1 (33.3%) teriparatide. Among 10 OP-only patients, denosumab was the chosen treatment in 40.0%. Bisphosphonates and romosozumab were chosen each in 15.3% (2) patients and teriparatide in 1(10.0%) case. One bedridden patient with advanced co-morbidities was managed palliatively.
In the total population, 35.0%(7) received teriparatide, 35.0%(7) denosumab, 10.0%(2) romosozumab, 10.0%(2) bisphosphonates, and 10.0%(2) were followed without treatment (one palliative, one by shared-decision) (Table-1).

Conclusion:
In this series, half of CKD patients with OP had overt biochemical CKD-MBD, with ABD being the most common form (70.0%). Treatment options varied based on CKD-MBD type and patient characteristics, highlighting the complexity of metabolic bone diseases in older adults with CKD and the need for individualized care.

Table-1: Characteristics, diagnosis and management of the participants

Patient Age/Sex	Previous Fragility Fracture	Fragility Fracture Location	T Score L1-4	T Score Femur Neck	T Score Femur Total	T Score distal forearm	FRAX hip (%)	FRAX major (%)	Creatinine (md/dl)	Calcium[3] (mg/dl) (8.6-10.3)	Phosphorus (mg/dl) (2.7-4.5)	PTH Pg/ml (15-65)	ALP (35-105)	Bone spesific ALP (6-21 µg/L)	25-OH Vit D (ng/ml)	Diagnosis	Management
67, F	Yes	vertebra	-1.8	N/A[1]	N/A	-2.7	10	27	3.79	9.08	2.35	117	99	15.6	17	CKD-MBD (ABD) + OP	Teriparatide after cessation of active vit D and phosphate binders
85, M	No	-	-0.7	-2.6	-1.8	N/A	6	16	2.24	9.3	3.9	32	111	11.8	39	CKD-MBD (ABD) + OP	Teriparatide after cessation of vit D and calcium
72, F	No	-	0.8	-1.7	-1	-3.5	2.1	9.6	5.3	8.9	2.68	86	69	12	56	CKD-MBD (ABD) + OP	Cessation of active vit D and vit D Follow-up without treatment: Due to low FRAX scores (shared decision with the patient)
81, M	No	-	-0.2	-3.3	-3	N/A	4.5	7.6	1.66	9.12	3.99	110	84	N/A	23	OP	Denosumab
78, F	Yes	Vertebra	-0.6	-3.1	-2.5	N/A	11	26	2.19	10.25	4.02	268	106	20	13	OP	Denosumab
78, M	No	-	-4	-4.1	-4.3	N/A	N/A	N/A	1.82	8.8	2.8	173	54	10.6	27	OP	Denosumab + testosteron replacement
86, F	Yes	Hip	-0.2	N/A[2]	N/A	-5	20	44	1.25	9.3	4.54	98	155	N/A	8.9	OP	Teriparatide
78, F	Yes	Vertebra	-4.3	-3.2	-3.6	N/A	N/A	N/A	1.10	8.9	3.2	75	116	N/A	21	OP	Romosozumab
74, F	No	-	-1.7	-2.4	-1.1	N/A	6.5	15	2.30	9.1	3.8	40	103	N/A	34	CKD-MBD (ABD) + OP	Denosumab, after cessation of calcium and no evidence of ABD
82, M	Yes	Vertebra	N/A	N/A	N/A	N/A	N/A	N/A	1.32	9.2	3	28	66	N/A	5	CKD-MBD (ABD) + OP	Teriparatide
83, F	Yes	Vertebra	-0.7	-1.6	-0.4	N/A	8.6	19	1.2	9.8	4	45	51	N/A	30	OP	Continuation of oral bisphosphonate therapy
74, M	No	-	-1.8	-3.7	-2.8	N/A	N/A	N/A	1.45	9.9	3.4	54	69	15.6	35	OP	Zoledronate
74, F	Yes	Vertebra	-2.2	-2.4	-1.5	N/A	3	16	1.2	9.5	3.9	55	53	N/A	38	OP	Romosozumab
85, M	Yes	Vertebra	N/A	N/A	N/A	N/A	N/A	N/A	1.84	8.9	3.4	55	103	N/A	64	CKD-MBD (ABD) + OP	Teriparatide
75, F	Yes	Hip and vertebra	-2.9	-3.5	-3.5	N/A	12	30	1.3	9.5	3.9	22	70	22	20	CKD-MBD (ABD) + OP	Teriparatide
71, M	Yes	Hip	-2.5	-3.6	-3.5	N/A	N/A	N/A	2.3	7.7	3.5	480	130	N/A	15	OP + CKD-MBD (OM)	Denosumab after calcium and vitamin D supplementation
67, M	Yes	Hip	N/A	N/A	N/A	N/A	N/A	N/A	2.22	9.3	3.8	96	91	N/A	16	OP	Follow-up without treatment (Due to low life expectancy and being bedridden)
82, M	Yes	Hip and vertebra	-0.2	-1.8	-1.8	N/A	5.2	11	1.9	9	2.8	124	84	N/A	6	OP + CKD-MBD (OM)	Teriparatide after vitamin D supplementation
78, F	Yes	Vertebra	-3.4	-3.4	-3	N/A	25	38	2.1	9	3.2	106	87	N/A	10	OP + CKD-MBD (OM)	Denosumab after vitamin D supplementation
79, M	No	-	-1.6	-2.5	-1.9	-1.9	4.3	8.9	1.53	8.9	2.6	113	78	14.7	42	OP	Denosumab

[1] due to avascular necrosis of femoral head
[2] due to fracture of b/l femoral neck
[3] Corrected calcium (by albumin)
N/A: not available, OP: Osteoporosis, CKD-MBD: Chronic Kidney Disease-Mineral Bone Disorder, ABD: Adynamic Bone Disease, OM: Osteomalacia, ALP: Alcaline Phosphatase, PTH: Parathormone

P1424

TOWARDS A CORE OUTCOME SET (COS) FOR SARCOPENIA INTERVENTION STUDIES: A SYSTEMATIC REVIEW IDENTIFYING THE MOST FREQUENTLY REPORTED OUTCOMES ACROSS RANDOMIZED CONTROLLED TRIALS IN SARCOPENIA

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Objective:
This study aimed to identify the most frequently reported outcomes in sarcopenia trials through a systematic review, as a basis for developing a Core Outcome Set (COS).
Material and methods:
A systematic review was conducted using MEDLINE, Embase, and Cochrane Central (PRISMA guidelines; PROSPERO: CRD42024525506). Eligible studies were randomized controlled trials (RCTs) on sarcopenia treatment, conducted in patients with the disease, and using a consensus definition of sarcopenia. Outcomes were extracted and grouped into predefined subcatego-

ries, with a focus on primary outcomes.
Results:
Of the 3985 references reviewed, 58 RCTs met the inclusion criteria. These included 216 efficacy and 39 safety outcomes. The most frequently reported outcomes, after unifying synonyms terms, were muscle mass (50 RCTs, i.e., present in 86.2% of the trials), muscle strength (50 RCTs, 86.2%), physical performance (47 RCTs, 81%), nutrition-related outcomes (41 RCTs, 70.7%), and biomarkers (31 RCTs, 53.4%).
Among the primary outcomes, change in muscle mass was the most commonly reported outcome (23 RCTs, 39.7%), with appendicular muscle mass index and fat-free mass as the predominant measures (4 RCTs, 6.9%). Change in muscle strength was the second most frequently reported primary outcome (16 RCTs, 27.6%), mainly assessed by handgrip strength (12 RCTs, 20.7%). Change in physical performance was the third most common outcome (13 RCTs, 22.4%), with gait speed (7 RCTs, 12.1%) and lower limb physical function (4 RCTs, 6.9%) were the most reported physical performance-related outcomes.
Secondary outcomes included fat mass, physical status, quality of life, activities of daily living, cognitive function, psychological status, bone mass, and unclassified outcomes.
Conclusions:
This review highlights the large heterogeneity of outcomes in sarcopenia trials. Muscle mass, muscle strength, and physical performance are the most frequently reported outcomes. A sarcopenia-specific COS is needed to standardise reporting, improve comparability and strengthen evidence for treatments, to support better and more efficient research and to improve the care of patients with sarcopenia.
Disclosures: The authors have no conflicts of interest to declare.

P1425

EVALUATING THE PRAGMATISM OF SARCOPENIA CLINICAL TRIALS USING PRECIS-2: A SYSTEMATIC REVIEW

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Objectives:
This study aims to review interventional clinical trials in sarcopenia to assess their level of pragmatism and identify gaps to improve the clinical relevance and feasibility of future trials in the real world.
Material and Methods:
A systematic review was conducted using MEDLINE (via Ovid), Embase, and Cochrane Central Register of Controlled Trials (PRISMA guidelines; PROSPERO: CRD42024571027). Eligible studies included randomized controlled trials (RCTs) on sarcopenia treatment using a consensus definition. The PRECIS-2 tool was used to assess the level of pragmatism of these RCTs across nine standard domains (eligibility, recruitment, setting, organisation, flexibility of delivery, flexibility of adherence, follow-up, primary outcome, and primary analysis), with an additional "control" domain. Total PRECIS-2 scores were calculated, and subgroup analyses were conducted by intervention type, geographical location, sample size, study duration, and sarcopenia definition.
Results:
Of the 3,985 references reviewed, 58 RCTs met the inclusion criteria. The mean PRECIS-2 score across its 10 domains was 2.92 (SD 1.30), reflecting a balance of explanatory and pragmatic characteristics. Organisation, recruitment, and primary outcome were identified as the most pragmatic domains, whereas eligibility, adherence, and follow-up were the most explanatory. Subgroup analyses revealed that geographical location and sarcopenia definitions impacted significantly the overall PRECIS-2 score. More precisely, studies conducted in Asia achieved higher pragmatism scores, with significant differences in setting ($p = 0.016$), follow-up ($p = 0.009$), and control ($p = 0.011$). Studies using Asian sarcopenia criteria (e.g. AWGS) were also more pragmatic, particularly in the setting ($p = 0.036$) and control ($p = 0.010$).
Conclusion:
Due to the reversible nature of sarcopenia, clinical trials in this area have increased significantly in recent years. Although some methodological aspects of these RCTs follow pragmatic approaches, this systematic review highlights the need for improvements in areas such as exclusion criteria, follow-up and adherence. Specifically, there is an urgent need to design RCTs that more accurately reflect the complexity of real-world interventions in the multifaceted landscape of sarcopenia.
Disclosures: The authors have no conflicts of interest to declare.

P1426

VERTEBRAL FRACTURES IN CHRONIC KIDNEY DISEASE PATIENTS - A POPULATION-BASED COHORT STUDY FROM TCVGH-OPC DATABASE

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Objectives
This study aims to evaluate the prognosis of surgical interventions for vertebral fractures (VFs) in patients with chronic kidney disease (CKD) and identify the risk factors for mortality, complications, and refractures.
Materials and Methods
Patients were enrolled from the Osteoporosis Prevention Center at Taichung Veterans General Hospital. Those who underwent vertebroplasty or spinal fusion for VF between 2011 and 2023 were included. All participants underwent dual-energy X-ray absorptiometry (DXA) to assess bone mineral density (BMD). Patients with incomplete data or follow-up periods of less than three months were excluded. The cohort was analyzed for mortality

rates, complication rates, and refracture rates. Additionally, the use of osteoporosis-related medications and the presence of comorbidities were examined.

Results

From 2011 to 2023, 1,280 patients underwent vertebroplasty or spinal fusion for VFs. Of these, 1,007 (78.7%) were female, and 273 (21.3%) were male. A total of 349 patients (27.3%) were classified as having CKD based on an eGFR < 60 mL/min/1.73 m². Patients in the CKD group had lower BMD and a higher prevalence of comorbidities compared to non-CKD patients. CKD patients exhibited higher mortality rates (hazard ratio = 2.07) in the Cox regression model and a greater risk of complications (odds ratio = 1.78) in the logistic regression model following surgery. Multivariate regression analysis revealed that mortality was significantly associated with eGFR < 60 mL/min/1.73 m², older age, male gender, diabetes, and lower serum albumin levels. The risk of complications was correlated with diabetes, coronary artery disease, and lower serum calcium levels. Refracture rates were associated with rheumatoid arthritis, hypertension, and the use of calcium supplements postoperatively.

Conclusion

Surgical treatment for vertebral fractures in patients with chronic kidney disease is associated with higher mortality rates and increased risks of complications. Spine surgeons should be vigilant about these risks when managing CKD patients undergoing such procedures.

P1427

LONG-TERM ANTI-RESORPTIVE THERAPY: IDENTIFYING THE OPTIMAL TREATMENT STRATEGY THROUGH A RANDOMIZED CONTROLLED TRIAL

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【Introduction】

Osteoporosis requires lifelong management, with available treatments including anabolic and anti-resorptive agents. Anabolic agents are limited to short-term use, often requiring sequential therapy. Anti-resorptive agents also have drawbacks: denosumab can cause rapid bone loss upon stopping, and bisphosphonates show bone mineral density (BMD) gains that plateau after 3-5 years. Studies suggest denosumab after bisphosphonates can still improve BMD. We aim to evaluate whether sequential use of denosumab and zoledronate can achieve BMD gains comparable to continuous denosumab therapy.

【Materials and Methods】

This randomized controlled trial includes patients who have received 4 or 5 doses of denosumab (2 or 2.5 years). Baseline characteristics, BMD, and bone turnover markers (BTMs), including P1NP and CTX, are assessed before randomization.

The intervention group receives zoledronate six months after their last denosumab dose, then resumes denosumab in the second and third years. The control group continues regular denosumab for three years. BMD and spinal X-rays are assessed annually, and BTMs every six months. The primary outcome is the change in lumbar spine BMD over three years, with secondary outcomes including changes in hip and femoral neck BMD, CTX, P1NP, and fragility fracture incidence.

【Results】

Fifty-nine patients were recruited, 91.5% female, with a mean age of 71.2 years. After three years, the intervention group had BMD gains of 4.8% in the lumbar spine, 3.2% in the femoral neck, and 2.0% in the total hip, while the control group showed gains of 4.6%, 2.9%, and 2.3%, respectively. BMD changes did not differ significantly between groups. In the intervention group, P1NP levels rose after zoledronate in the first year and decreased significantly after resuming denosumab. Few osteoporotic fractures were reported.

【Discussion】

This treatment strategy increases BMD non-inferior to continuous denosumab, offering several advantages, such as increased treatment flexibility and eliminating concerns about rebound effects upon drug discontinuation. The elevated P1NP during the transition year to zoledronate also provides an opportunity to repair accumulated microdamage from long-term anti-resorptive therapy.

【Conclusions】

Our treatment strategy appears to be a promising approach for long-term osteoporosis management. However, the effectiveness and safety of sequential treatment with denosumab and zoledronate require further validation.

P1428

ANTIRESORPTIVE MEDICATION USE PRIOR TO TERIPARATIDE AND FRACTURE-RELATED HOSPITALIZATIONS IN PATIENTS AT VERY HIGH FRACTURE RISK: A POPULATION-BASED COHORT STUDY

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Introduction:

Transitions from long-term antiresorptive therapy to anabolic agents may cause a temporary decline in bone mineral density and probably increase fracture risk. To assess the effect of prior anti-osteoporosis medication(AOM) use on osteoporotic fracture-related hospitalisations in patients at very high fracture risk who started teriparatide therapy, focussing on the influence of AOM type and duration.

Materials and Methods:
This nationwide population-based longitudinal cohort study utilised data from Taiwan's National Health Insurance Research Database spanning the years 2013–2019. 21,814 patients were prescribed teriparatide, of whom 14,770 met the inclusion criteria and were analysed. Patients were categorised into two groups according to prior AOM use: AOM use, n = 9,127; non-AOM use, n = 5,643. The primary outcome was hospitalisation for osteoporotic fractures within 3 years of teriparatide initiation. This study further evaluated fracture-related hospitalisations based on specific subgroups, namely, prior AOM type and duration.
Results:
9,127 participants received AOM treatment within 2 years prior to teriparatide initiation, whereas 5,643 did not. Over a median follow-up period of 36.3 months, no significant differences in fracture-related hospitalisations were observed between the two groups. Hazard ratios (HRs) for fracture-related hospitalisation were lower in the AOM group compared with the non-AOM group (1 vs. 0.92, respectively; CI 0.83 to 1.02; p = 0.10), but the difference was not statistically significant. However, patients who had used denosumab for ≥3 years before switching to teriparatide had a significantly higher risk of vertebral fracture-related hospitalisations (adjusted HR 1.86, p = 0.0118), particularly within the first 6 months of transitioning (aHR 1.98, p = 0.01).
Discussion:
Prior AOM therapy does not increase fracture-related hospitalisation risk after starting teriparatide in patients at very high risk, except in cases of long-term (≥3 years) denosumab use. Clinicians should exercise caution with long-term denosumab treatment before transitioning to teriparatide therapy. Further research is warranted to optimise sequential therapy strategies.

P1429

COMBINED DENOSUMAB AND CORE DECOMPRESSION DELAY CONVERSION TO TOTAL HIP ARTHROPLASTY IN FEMORAL HEAD OSTEONECROSIS

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Objective(s): To evaluate the impact of denosumab on femoral head osteonecrosis (ONFH) in patients undergoing core decompression surgery, focusing on time to total hip arthroplasty (THA) and radiographic progression.
Material and Methods: This retrospective study included 53 patients (67 hips) with Steinberg stage IIC or IIIC ONFH over five years. Patients were divided into two groups: the denosumab group (n=32), receiving two 60 mg doses postoperatively, and the control group (n=35), undergoing core decompression alone. Primary outcome was time to THA, while secondary outcomes included radiographic progression and functional outcomes. Statistical analysis assessed survival rates and progression differences.
Results: The denosumab group demonstrated a higher THA-free survival rate (87.5% vs. 64.71%), though the difference was not statistically significant (P=0.0821). Radiographic progression rates were similar between groups (56.25% vs. 58.82%; P=0.85). Subgroup analysis suggested potential benefits in stage IIC patients, with trends indicating reduced THA conversion rates in the denosumab group (P=0.095).
Conclusion: Denosumab may improve outcomes following core decompression by delaying femoral head collapse in ONFH, particularly in earlier stages. While results show promising trends, further randomized studies are needed to confirm its efficacy in combination with core decompression.

P1430

THE PHENOMENON OF CLINICAL INERTIA IN GOUT THERAPY

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Objective: One of the reasons for the ineffective treatment of gout is the low "survival" of therapy due to insufficient patient compliance. However, it is known that patient education can increase adherence to therapy and achieve target uric acid levels in 8 out of 10 people [Rees F, 2013], which indicates, among other things, the insufficient quality of patient management. The so-called phenomenon of "clinical inertia" - the inability to initiate or intensify therapy in accordance with evidence-based guidelines - seems to be a possible explanation for this situation. The aim of the study: to evaluate the dynamics of patient management with gout in real clinical practice.
Methods: The study was conducted in 2 stages. At the first stage in 2017, a voluntary anonymous survey of 97 doctors was conducted, at the second, in 2021 - 46 doctors, represented mainly by therapists and rheumatologists, as well as doctors of other specialties (surgeons, cardiologists, traumatologists, neurologists). The questions touched on the treatment of gout in the acute and interictal period, and the opinion of doctors regarding patient compliance.
Results: Almost all doctors who answered the questionnaire indicated that they treat gout. The exception was neurologists at stage 2 (a total of 6 people), who were excluded from the analysis. When answering the question "How many patients with gout do you observe on average per month?" At stage I, from 1 to 40 patients were indicated, at stage II - from 0.5 to 25. As a therapy for an exacerbation of the disease, the majority of doctors chose NSAIDs: 100% at stage I and 86.9% at stage II, colchicine was used prophylactically almost exclusively by rheumatologists - 38.9% at stage I and 100% at stage II, p = 0.18, while therapists used it quite rarely - 1.7% at stage I and 20% at stage II, p = 0.02.

Also, 20% of therapists at stage I and 26.7% at stage II used urate-lowering therapy (ULT) drugs - allopurinol and febuxostat - to "stop an attack". The prescription of ULT at both stages of the study was quite high and amounted to 100% for rheumatologists; 75% and 93.3% for therapists. The time of therapy prescription varied on average from 7 to 14 days after the attack, immediately after the exacerbation UST was prescribed by 5% of therapists at stage I and 13.3% at stage II; during the attack - 20% of therapists at stage I and 13.3% at stage II. The dose of allopurinol in practice varied on average from 100 to 300 mg/day - 61.1% of rheumatologists at stage I and 100% at stage II; for therapists, the figures were 81.6% and 73.3%, respectively. The possible use of a dose higher than 300 mg was indicated by only 38.9% of rheumatologists and 11.3% of therapists at stage I and 33% of rheumatologists and 13.3% of therapists at stage II. It is noteworthy that the most frequently cited reasons for such a dose of UST are “existing recommendations”, side effects of the drugs, creatinine clearance control, and also the maximum permissible dose of allopurinol at 300 mg/day (!). The assessment of the “survival” of UST according to rheumatologists and therapists was 63.1% and 59.4% at stage I, 55% and 54.3% at stage II, respectively. At the same time, the expectation of attacks in patients decreased from 36.5% by rheumatologists and 49.1% by therapists at stage I to 10% and 28.75% at stage II, p=0.14.

Conclusion: Despite some increase in the number of doctors using UST in gout therapy, real clinical practice seems to be quite inert. The low use of colchicine for the treatment and prevention of attacks, frequent (26.7%) prescription of UST for the relief of acute attacks and low average doses of allopurinol remain at the same level.

P1431

DEEP LEARNING-BASED OSTEOPOROSIS SCREENING: LEVERAGING CONVOLUTIONAL NEURAL NETWORKS FOR HIP X-RAY ANALYSIS

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Objective: To assess the effectiveness of Convolutional Neural Networks (CNN) for osteoporosis screening using plain hip radiographs.

Material and Methods: Osteoporotic fractures, particularly spine and hip fractures, can lead to severe health consequences like long-term disability and increased mortality. Osteoporosis is underdiagnosed, and the current gold standard screening tool, Dual-energy X-ray Absorptiometry (DEXA), is expensive and inaccessible to most of the population– especially in rural areas [1]. Most diagnoses are not made until fractures occur. There is a need for an accessible, affordable, and accurate osteoporosis screening method to prevent fracture risks while simultaneously improving patient outcomes. With the current technological advances, deep learning techniques should be considered to offer a solution by analyzing plain hip radiographs to determine the presence of osteoporosis for early diagnosis [2]. We collected a dataset of standard hip radiographs from both healthy and osteoporotic patients. A deep learning model based on the Xception architecture was developed and trained on this dataset. The model was designed to classify radiographs as indicative of osteoporosis or normal, using image preprocessing techniques and data augmentation to enhance model robustness. We implemented a training pipeline using TensorFlow, with the dataset comprising 287 images (99 abnormal, 188 normal) split into training, validation, and test sets. The model was trained for 100 epochs with a batch size of 32, using Adam optimizer and categorical cross-entropy loss. We employed techniques such as dropout and early stopping to prevent overfitting. The model’s performance was evaluated using accuracy, precision, recall, F1 score, and Area Under the Receiver Operating Characteristic Curve (AUC-ROC).

Results: The CNN model demonstrated high performance in classifying hip radiographs, achieving an accuracy of 94.44%, with 95.00% precision, 94.44% recall, 94.43% F1 score, and an AUC-ROC of 0.944 in identifying osteoporosis through recognition of hip abnormality in radiographs(Figure 1). The model is robust in distinguishing between normal and abnormal hip X-rays(Figure 2).

Figure 1

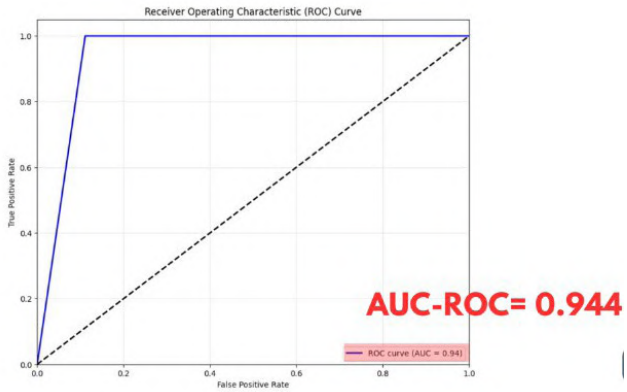
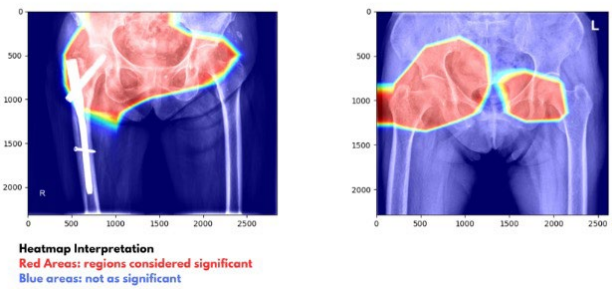


Figure 2



Conclusion: Our study demonstrates the potential of CNN in analyzing hip X-rays for osteoporosis screening. The model’s high performance in our dataset suggests that AI-based methods could serve as a promising tool to assist in the initial screening process, especially in rural locations where access to affordable diagnostic services is limited.

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P1432

METABOLIC DYSFUNCTIONS IN CHRONIC PAIN PATIENTS THROUGH THERMOGRAPHIC ANALYSIS

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Objectives
To utilize infrared thermography in patients with musculoskeletal pain and recognize associated metabolic dysfunctions.
Material and Methods
Clinical thermography provides a rapid, radiation-free method, generating images of varying surface skin temperatures and allowing for arbitrary repetitions of measurements (KACZMAREK e NOWAKOWSKI, 2016). This method can detect subtle alterations in underlying tissues, indicating musculoskeletal and metabolic pathologies. Infrared imaging cameras, following the standardized parameters of the BodyScan InfraRed Med® Sequence, capture infrared radiation emitted from the body's surface, converting it into electrical signals to create a thermogram campable of displaying temperatures of diverse colors and tones (DIAKIDES, DIAKIDES, *et al.*, 2006).
In this retrospective and analytical observational study, 138 patients of both sexes with musculoskeletal pain, who required orthopedic consultation between 2022 and 2024, were analyzed. Thermographic analysis revealed various gastrointestinal alterations, periocular congestion and reduced metabolic activity directly linked to the pain exhibited by these patients.
Results
A total of 138 individuals diagnosed with musculoskeletal pain were evaluated, comprising 69.6% women and 30.4% men. Thermographic analysis proved to be a reliable complementary method, showing statistically significant results ($p < 0.05$). The thermography detected notable metabolic conditions and disruptions in the sleep-wake cycle among chronic pain patients.
Conclusion
Clinical thermography proved itself to be a non-invasive, complementary and diagnostic method for identifying metabolic imbalances related to gastrointestinal dysfunctions, emotional states, and sleep-wake cycle disruptions in chronic musculoskeletal pain patients.

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P1433

DOES LOW QUADRICEPS STRENGTH INFLUENCE THE RISK OF DISABILITY? - THE ROAD STUDY-

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[Objective] We investigated the association between low quadriceps muscle strength (i.e., muscle weakness) and the incidence of disability among Japanese men and women, using data from a large-scale, population-based cohort study called ROAD (Research on Osteoarthritis/Osteoporosis Against Disability).
[Methods] We analyzed data from 1,558 participants (505 men and 1,053 women; mean age: 65.5 years) residing in mountainous and coastal communities during the 3rd survey of the ROAD study. All participants underwent measurements of both muscle mass and quadriceps muscle strength. To define muscle weakness, we determined cutoff values for quadriceps strength by conducting an ROC analysis, using quadriceps strength as the independent variable and the presence or absence of sarcopenia as the dependent variable, stratified by sex.
Additionally, among participants aged 65 years or older who had not been certified as disability at the time of the third survey, we used 3-year and 6-year follow-up data to ascertain new cases of disability certification and calculated the incidence rate using person-year methods.
[Results] Among participants aged 65 years or older, the prevalence of muscle weakness was 46.0% (48.1% in men and 45.0% in women). The incidence of disability was 19.9 per 1,000 person-years (13.3 in men and 23.1 in women). After adjusting for age, sex, body mass index, and residential area in a Cox regression analysis, muscle weakness was associated with a significantly higher risk of disability certification (hazard ratio: 2.69, 95% confidence interval: 1.54–4.96).
[Conclusion] Based on the results of a 6-year longitudinal study from a large-scale, population-based cohort, we estimated the prevalence of muscle weakness and the incidence rate of disability. Our findings suggest that low muscle strength is a risk factor for disability.

P1434

PREVALENCE OF AND FACTORS ASSOCIATED WITH MRSA AMONG PATIENTS WITH HAND INFECTION TREATED IN A PUBLIC TERTIARY HOSPITAL

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Background: Methicillin-resistant Staphylococcus aureus (MRSA) poses significant challenges in managing hand infections, especially in resource-limited settings like the Philippines. Despite its global prevalence, data on MRSA-specific hand infections in Filipino patients remain scarce. This study aimed to determine the prevalence of MRSA and identify associated factors among patients treated for hand infections at a public tertiary hospital.
Methods: A retrospective, cross-sectional study was conducted at Jose B. Lingad Memorial General Hospital from February 2022 to January 2024. Data from 233 patients treated for hand infections were analyzed. Variables examined included demographics, employment status, infection etiology, comorbidities, traditional medicine use, infection location, and classification. Statistical analyses were performed to identify associations with MRSA.
Results: MRSA prevalence was 30%, with bite wounds and use of traditional medicine showing significant associations (p = 0.002). Educational attainment was also linked to MRSA status, with unschooled individuals having a higher prevalence (p = 0.027). Other variables, such as age, gender, employment, comorbidities, and infection classification, showed no significant associations.
Conclusion: This study highlights the high prevalence of MRSA in hand infections, with traditional medicine use and bite wounds as key risk factors. The findings underscore the need for targeted educational campaigns, early intervention protocols for bite wounds, and community engagement to address traditional medicine practices. These measures could improve MRSA management and prevention in similar settings.

P1435

THE INFLUENCE OF AGE, GENDER, AND THE UPPER EXTREMITY ANTHROPOMETRY ON THE PALMAR GRIP STRENGTH IN PATIENTS SUFFERING FROM RHEUMATOID ARTHRITIS

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Objective: To examine the influence of age, gender, and upper extremity anthropometry on the palmar grip strength in patients with rheumatoid arthritis (RA).
Material and methods: This 6-month prospective study included 56 patients of both sexes treated at the Special Hospital for Rheumatic Diseases in Novi Sad, Serbia. All participants signed an informed consent form and completed a sociodemographic questionnaire compiled by the researcher. They also underwent tape measurements (cm) to establish total upper limb length, the length of the upper arm, forearm, and hand, and the wrist and hand circumference for both upper limbs. The palmar grip strength (kg) was evaluated using the Baseline Mechanical Pinch Gauge dynamometer via three measurements separated by 60 s breaks. The relationship between two numerical variables was examined via the non-parametric Spearman correlation coefficient, with p≤0.05 indicating statistical significance. Statistical processing and analyses were performed using the SPSS ver. 24 statistical package.
Results: All participants (92.9% women, average age 63) were right-handed. No statistically significant correlation between the palmar grip strength in either hand and age was noted (p>0.05). However, male subjects performed statistically significantly (p=0.012) better on the left-hand grip strength test (Me=9.17) compared to females (Me=4.75). Moreover, the right-hand length and the right-hand grip strength were positively correlated (rho=0.290, p=0.030). The remaining variables, such as upper limb length (p=0.137), upper arm length (p=0.433), forearm length (p=0.251), wrist circumference (p=0.263), and hand circumference (p=0.700), did not show statistically significant correlation with the right-hand palmar grip strength.
Conclusion: Male RA patients, as well as those with a longer right hand, achieved better left-hand palmar grip strength results, which were unaffected by age. In future research, it is necessary to analyze the impact of disease activity and the number of painful and swollen joints of the upper extremities on the palmar grip strength.

P1436

THE INFLUENCE OF BODY HEIGHT AND BODY MASS ON GROSS HAND MUSCLE STRENGTH AND PINCER GRIP IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Objective: To examine the influence of body height and body mass on gross hand muscle strength and pincer grip in patients with rheumatoid arthritis (RA).
Material and methods: The present study, based on a prospective research design, was conducted at the Special Hospital for Rheumatic Diseases in Novi Sad, Serbia, after obtaining approval

of the hospital's Ethics Committee. The study sample included 56 rheumatoid arthritis (RA) patients, all of whom were on a stable disease-modifying antirheumatic drug (DMARD) dose and were right-handed. Prior to commencing the study, all participants signed an informed consent form. Their sociodemographic data was gathered via a questionnaire developed specifically for this research. For all patients, body height and body mass, as well as pincer grip strength and gross muscle strength in both hands, was measured in triplicate with a 1-minute break between consecutive measurements. The SPSS (Statistical Package for the Social Sciences) ver. 24 was used for data analysis and processing.

Results: The median age of the participants (most of whom were women, 92.9%) was 63 years. Their average body height and mass were Me = 163 cm and Me = 76.50 kg, respectively. A statistically significant positive correlation was noted between body height and gross muscle strength in both hands (R: rho = 0.459, p = 0.000; L: rho = 0.428, p = 0.001). Likewise, body height was in a statistically significant positive relationship with pincer grip strength in both hands (R: rho = 0.379, p = 0.004; L: rho = 0.445, p = 0.001). In the left hand, there was also a statistically significant positive correlation between body mass and gross muscle strength (rho = 0.289, p = 0.031) as well as pincer grip (rho = 0.275, p = 0.040).

Conclusion: In RA patients, gross hand muscle strength and pincer grip tend to increase with body height and body mass.

P1437

THE CLINICAL PROFILES OF PEOPLE WITH KNEE OSTEOARTHRITIS WITH OR WITHOUT A PRIOR KNEE SURGERY. A REGISTRY-BASED STUDY FROM THE SWEDISH OSTEOARTHRITIS REGISTRY WITH 77 000 INDIVIDUALS

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Objectives: To compare individual and clinical characteristics of individuals with knee osteoarthritis (OA) with or without prior knee surgery.

Methods: This observational registry-based study includes data from the Swedish Osteoarthritis Register between 2008-2022. The Swedish Osteoarthritis Register contains data about individuals participating in first-line OA treatment (education and exercise) in primary care in Sweden. Individuals with a self-reported prior knee surgery were compared to individuals without a prior knee surgery with regards to individual characteristics (sex, age, BMI) and clinical characteristics (Charnley classification, intake of OA medication, fear of movement, walking difficulties, willingness of surgery, physical activity level, pain, and health-related quality of life) using logistic regression and Odds ratio (OR).

Results: The analysis included 77 791 individuals with knee OA of which 13 558 (21 %) reported a prior knee surgery. Individuals with a prior knee surgery had lower odds of being a woman (OR 0.439, 95% CI 0.416 to 0.464) were younger, (OR 0.957, 95% CI 0.954 to 0.959), had a lower BMI (OR 0.966, 95% CI 0.969 to 0.972), and less fear of movement (OR 0.913, 95% CI 0.852 to 0.979) compared to those without prior surgery. On the other hand, those who reported a prior knee surgery had higher odds of being physically active (OR 1.159, 95%CI 1.095 to 1.228), having walking difficulties (OR 1.856, 95%CI 1.744 to 1.975), having a wish for surgery due to OA symptoms (OR 1.856, 95%CI 1.744 to 1.975) and higher health-related quality of life (OR 1.228, 95% CI 1.028 to 1.466). There was no difference between individuals with and without a prior knee surgery for Charnley classification, pain intensity, pain frequency or intake of OA medication.

Conclusion: Individuals with knee OA, with and without a prior knee surgery differ in both individual and clinical characteristics. Individuals with knee OA and a prior knee surgery seem to enter first-line treatment at a younger age, with a lower BMI, with less fear of movement, a higher level of physical activity, a higher self-reported health-related quality of life but with more walking difficulties and a higher willingness of surgery. These group differences need to be considered in clinical practice to enhance individualized OA treatment in this group of individuals.

P1438

PREVALENCE OF OSTEOPOROSIS, LOW TRABECULAR BONE SCORE, AND FRACTURE RISK IN RHEUMATOID ARTHRITIS PATIENTS

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Overview: Rheumatoid arthritis (RA) patients are at high risk of osteoporosis and fractures, particularly with prolonged glucocorticoid use. Trabecular Bone Score (TBS), an indicator of bone microarchitecture, complements bone mineral density (BMD) in fracture risk prediction.

Objective: To assess the prevalence of osteoporosis, low TBS, fracture risk, and treatment indications in RA patients.

Methods: A cross-sectional study of 131 RA patients, at Nguyen Tri Phuong Hospital, measured BMD and TBS. Osteoporosis was defined using Tscore according to WHO criteria with Asian reference ranges, while TBS thresholds were set at ≤1.23 and ≤1.32. Fracture risk was assessed with FRAX and TBS-adjusted FRAX. Treatment recommendations followed Asia Pacific Consortium on Osteoporosis (APCO) guidelines. Kappa coefficients assessed concordance between BMD, TBS, and fracture risk tools (FRAX).

Results: Most patients were female (83.2%), with a mean age of 60.2 ± 9.3 years and BMI of 23.0 ± 3.4 kg/m². Fractures occurred in 21.4% of patients, and 33.6% were on bisphosphonates. Hypertension (44.3%), sarcopenia (20.6%), and diabetes (17.5%) were common comorbidities. The median disease duration was 7 (3–11) years, with structural damage in 41.2%. Glucocorticoid use was reported in 61% of patients, mostly at low doses (<5 mg/day).

Osteoporosis prevalence was 22.1%, while osteopenia was ob-

served in 60.3%. Low TBS was found in 26%, and partially degraded TBS in 35.1%. Concordance between TBS and BMD was low (Kappa = 0.2), but combining tools identified 32.8% of patients as high risk. High concordance (Kappa > 0.8) was observed between FRAX and TBS-adjusted FRAX, identifying 5.3% and 31% additional high-risk osteopenic patients for major osteoporotic fractures (MOF) and hip fractures (HF), respectively. According to APCO, 58.8% of patients required treatment.

Conclusion: Combining TBS and BMD enhances the identification of high-risk RA patients. Over half require osteoporosis treatment, emphasizing the need for comprehensive bone health management to reduce fracture risk.

Keywords: Rheumatoid arthritis, Osteoporosis, Trabecular bone score, Fracture risk.

P1439

RISK OF OSTEOPOROSIS AND DEGRADED TRABECULAR BONE SCORE IN RHEUMATOID ARTHRITIS PATIENTS

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Background: Patients with rheumatoid arthritis (RA) are at an increased risk of developing osteoporosis and fractures, particularly when treated with glucocorticoids [1]. Trabecular bone score (TBS) is a valuable complementary tool for evaluating bone microarchitecture, enhancing the prediction of fracture risk beyond bone mineral density (BMD) [2].

Objective: To determine factors associated with osteoporosis and degraded TBS in RA patients.

Methods: A cross-sectional study was conducted on 131 RA patients treated at Nguyen Tri Phuong Hospital. BMD and TBS were evaluated according to Asian reference standards, osteoporosis defined according to WHO criteria and TBS categorized using two cut-off points of <1.23 (degraded) and >1.32 (normal). General risk factors and RA-specific factors were analyzed using univariate analysis, followed by multivariate logistic regression to identify factors associated with osteoporosis (T-score ≤ -2.5) and degraded TBS (<1.23).

Results: Osteoporosis was identified in 22.1% of patients, while more patients (26%) exhibited degraded TBS. Combining BMD with TBS identified 32.8% of patients as high risk. Factors associated with osteoporosis included advanced age (OR = 1.05, p = 0.05), lower body weight (OR = 0.94, p = 0.02), and sarcopenia (OR = 2.99, p = 0.08). Degraded TBS was significantly associated with older age (OR = 1.13, p < 0.005) and structural RA associated bone damage (OR = 2.50, p = 0.09).

Conclusion: The study highlights that advanced age, low body weight, and sarcopenia are key factors associated with osteoporosis in RA patients. Similarly, older age and RA associated structural damage, are associated with degraded TBS. The combination of BMD and TBS is recommended for bone health assessment in RA. Comprehensive management strategies that address both bone integrity and joint health should be prioritized to mitigate fracture risks and improve outcomes in this patient population.

Keywords: Rheumatoid arthritis, Osteoporosis, Trabecular bone score, Risk factors

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P1440

A STUDY OF FACTORS ASSOCIATED WITH THE CONTINUATION RATE AND DISCONTINUATION OF 329 CASES OF ROMOSOZUMAB IN OUR HOSPITAL

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【Background】 Although musculoskeletal diseases are one of the major causes of bedridden patients, the treatment rate of osteoporosis is low, and even when treatment is initiated, the drug continuation rate has been noted to be very low. Therefore, we investigated the drug continuation rate of patients treated with romosozumab at our hospital.

【Methods】 We investigated the continuation rate of 329 romosozumab patients who received 12 injections of romosozumab per year between January 2021 and January 2023. Patients were classified into two groups: those who completed the study and those who discontinued the study. Factors related to discontinuation were examined. Reasons for discontinuation were also investigated.

【Results】 249 patients (76%) completed the treatment. The overall patient background at induction was 77.6±8.0 years of age, 299 (91%) were female, BMI 24.9±3.9 kg/m2, and mean T-score was -3.11±0.98 for the lumbar spine, -2.72±0.79 for the proximal femur, and -3.23±0.82 for the femoral neck. There were 213 patients (65%) with a history of vertebral fracture, 192 (58%) without prior treatment, 218 (66%) living in the city, with a mean history of 1.9 non-orthopedic diseases and 138 (42%) with injection site reaction. Bone density in the completion group increased significantly at all sites after 1 year (mean T-scores at 1 year: lumbar spine -2.48 ± 1.17, proximal femur -2.55 ± 0.75, femoral neck -2.97 ± 0.86). The completion group had a significantly lower percentage of patients with a history of 3 or more non-orthopedic conditions. Of the 80 patients who dropped out of the study, 34 did not return to the hospital and the reason for the dropout

was unknown. Other reasons included hospitalization, injection site reaction (13 patients), poor physical condition (7 patients), difficulty going to the hospital (6 patients), financial reasons (4 patients), relocation (4 patients), institutionalization (3 patients), family reasons (2 patients), and one patient who did not want to receive the drug because of weight loss after administration.

【Conclusion】 The lomosozumab retention rate for the 329 patients was 76%. The completion group was less likely to have a history of 3 or more non-orthopedic conditions.

P1441

SURROGATE MARKERS OF SARCOPENIA AND SARCOPENIC OBESITY IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Background. Sarcopenia and sarcopenic obesity are associated with frailty and disabilities such as cardiovascular disease, fractures, dementia, cancer, and increased all-cause mortality. The incidence and risk factors for sarcopenia and sarcopenic obesity remain unclear in patients with rheumatic diseases, particularly rheumatoid arthritis (RA).

Our study **aimed** to estimate the incidence of possible sarcopenia and sarcopenic obesity in patients with RA.

Materials and methods. Fifty-nine female patients with RA aged 50-79 years old were examined (62,9±7,9 years; height 161,6±7,7 cm; weight 68,8±13,2 kg; BMI 26,4±5,0 kg/m^2). The control group consisted of practically healthy subjects (n=86) who did not differ in age (64,7±7,8 years), height (161,0±4,9 cm), weight (69,4±12,2 kg), and BMI (26,8±4,8 kg/m^2). We used dual-energy X-ray absorbtiometry (DXA) by estimating appendicular lean mass (ALM) and appendicular lean mass index (IALM) and considered possible sarcopenia as ALM <15 kg and/or IALM <5.5 kg/m^2 (EWGSOP2 criteria). Possible sarcopenic obesity was defined by ESPEN/EASO Consensus [Donini LM, et al., 2022] as the simultaneous presence of two criteria: the ratio of ALM to body weight (ALM/body weight) was <22% for women and fat mass (FM) increasing, the cut-off values for the Ukrainian population were >41% for females [Grygorieva NV et al., 2023].

Results. The incidence of possible sarcopenia in RA was significantly higher compared to controls by ALM and/or IALM (45.8 vs. 24.4%; p<0.05). The incidence of sarcopenic obesity was also higher registered in RA than in controls (33.9 vs. 8.1%; p<0.05). A significantly reduced muscle mass was found in RA compared to controls concerning ALM (15,4±3,8 kg vs 17,8±3,3 kg; p<0.05) and IALM (6,0±1,4 kg/m^2 vs 6,9±1,4 kg/m^2; p<0.05). Significant impact of RA on possible sarcopenia development (OR 5.2; 95% CI 2.34-11.54; P<0.001) and sarcopenic obesity (OR 5.78; 95% CI 2.26-14.85; P=0.0003) were detected.

A limitation of our study was that only DXA criteria were used to determine possible sarcopenia and sarcopenic obesity.

Conclusions. Possible sarcopenia and sarcopenic obesity in RA are more common in comparison with healthy subjects. The potential impact of RA on the muscular system may dominate the effect of age on the development of sarcopenia and sarcopenic obesity in this disease. Future research is needed to identify predictors of sarcopenia and sarcopenic obesity in RA.

P1442

RECOGNIZING AND MANAGING SARCOPENIA IN CHILDREN: REFERENCE MUSCLE MASS VALUES FROM A EUROPEAN COHORT

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Background & Aims: Sarcopenia, traditionally considered an aging-related condition, is increasingly recognized in pediatrics, where low muscle mass (LMM) affects growth and health outcomes. LMM is also a hallmark of malnutrition. Normative muscle mass values are critical for assessing LMM in children, yet current references are limited to a few studies conducted in specific populations, underscoring the need for further research. This study aimed to establish age- and sex-specific reference values for muscle mass in healthy children, representing a new population cohort.

Methods: A cross-sectional analysis of healthy children aged 5–14 years was conducted. Muscle mass was measured using Bioelectrical Impedance Analysis (BIA) after a minimum 8-hour fasting period. Percentile values for Fat-Free Mass (FFM) and Lean Body Mass (LBM) were calculated by age and indexed to weight, height squared, and BMI.

Results: A total of 844 healthy children (388 girls, 456 boys) were included. Age- and sex-specific percentiles for FFM and LBM were established. Comparative analyses with previously studied populations were performed. Reference values for FFM and LBM adjusted by BMI were reported for the first time.

Conclusion: This study provides normative reference values for muscle mass in children, offering a valuable tool for monitoring growth and diagnosing conditions such as sarcopenia and malnutrition. Further research in diverse populations is recommended to enhance the accuracy of LMM assessment.

P1443

A STANDARD EFFECTIVE TECHNIQUE FOR SHOULDER CAPSULITIS

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Objective:
This pilot observational study aimed to evaluate the effectiveness and side effects of a standardized shoulder hydrodilatation technique in patients with capsulitis, to inform the design of a future clinical trial.

Materials and Methods:
Patients with capsulitis of at least 3 months' duration, attending a rheumatology clinic in 2024, were included if they had no history of trauma, diabetes, or tumors, and had not responded to NSAIDs ± corticosteroids, physiotherapy, or corticosteroid injections. Pain (VAS), ultrasound findings (other lesions and capsule size), and shoulder range of motion were recorded before and one month after treatment. The procedure involved a suprascapular nerve block under ultrasound guidance, followed by injection of 4 ml lidocaine2%, 4 ml bupivacaine0,25%, and 1 ml triamcinolone. Shoulder hydrodilatation was performed using ultrasound to guide needle placement into the joint capsule, with a mixture of 1 ml triamcinolone, 4 ml bupivacaine, 4 ml lidocaine, and 11 ml saline (20 ml total) injected under hydrostatic pressure.

Results:
A total of 26 patients were referred, mean age 52.7 years; 17 (65.4%) were women,. One patients missed follow-up. 10 (38.5%) did not meet clinical or radiological criteria for capsulitis. Fifteen patients (57.7%) with clinical and radiologica criteria (>4 mm capsule thickness) received the treatment. VAS pain decreased from 8/10 pre-treatment to 1.33/10 post-treatment.

Ten patients (66.7%) experienced complete pain and functional relief (VAS: 8 to 0.6; flexion: 94.5º to 179/180º; abduction: 72º to 175.5/180º; external rotation: 20º to 72/80º). Five patients (33.3%) showed partial improvement due to comorbid conditions like supraspinatus tendinosis and osteoarthritis, with VAS pain decreasing from 8 to 2.8 and significant gains in range of motion (flexion: 77 to 146ª; abduction 61 to 146º; external rotation 13 to 52º). No secondary effects were reported, except for mild pain in one patient.No statistically significant differences in the time elapsed from diagnosis to treatment, or in the previous use of NSAIDs, physiotherapy or intra-articular corticosteroids were observed between these 2groups.

Conclusion:
The standardized shoulder hydrodilatation technique was highly effective in treating capsulitis, providing significant pain relief and functional improvement, even in patients with comorbid shoulder conditions.

P1445

COMORBIDITY, INCLUDING OSTEOPOROSIS, AND INTERFERON STATUS IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS: IS THERE AN ASSOCIATION?

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Background Type I interferon(IFN-I) play a central role in the pathogenesis of Systemic lupus erythematosus(SLE). Overexpression of IFN-I occurs in 60-80% patients with SLE. Type I IFN-inducible gene expression, measured using the IFN gene signature (IFGNS), provides a method to asses IFN-I pathway activation in individual patients. Against a background of genetic predisposition, a trigger stimulus, possibly microbial, induces the production of IFN-I and autoantibodies leading to inflammation. The risk of osteoporosis (OP) and fractures in SLE patients is higher than age- and sex- matched individuals from the general population. The aim of our study was to evaluate the possible association of comorbidities, including OP, with IFN gene signature in SLE.

Material and methods This observational retrospective-prospective study included 76 patients (86% women, median aged 33 [25;43] years (median [interquartile range 25;75%]), with a definite diagnosis of SLE (SLICC 2012) attending a routine visit at our Clinic between February 2021 and June 2024. Baseline demographics, menopausal and smoking status, body mass index(BMI), cardiovascular disease/stroke risk factors, renal disease, standard therapy (glucocorticoids, antimalarial, immunosuppressants,vitamin D) and IFNGS status (high/low) were analysed in SLE patients. Universally, dual energy X-ray absorptiometry (DEXA) is the mainstay for the diagnosis and monitoring of bone status. IFN status was assessed by the expression of IFN-inducible genes (MX1, RSAD2, EPSTI1) using real-time polymerase chain reaction. IFNGS was calculated as the average expression value of three selected genes. In patients, IFNGS was considered high when the average value of gene expression exceeded the average value of gene expression in donors. The control group consisted of 20 healthy donors comparable in sex and age with the SLE patients.

Results The median SLE duration was 2.3 [0.2;11.0] years, SLEDAI-2K 7 [4;11] score, SDI 0 [0;2] score.

At the time of inclusion in the study, SLE patients had the following manifestations: hematological disorders - 49%, most commonly leucopenia – 45%, inflammatory arthritis - 39%, nephritis - 33% (most commonly class IV), cutaneous lupus - 28%, serositis -18%, mucosal ulcers - 8%, nervous system involvement - 7%. Among 'non-criteria' symptoms the most common were: livedo – 20%, Raynaud's phenomenon - 12%, interstitial lung disease - 12%, lymphadenopathy - 8%, unexplained fever - 7%. Concomitant APS and Sjogren's syndrome were found in 12% and 38% of patients, respectively.

The majority of patients at the time of inclusion were taking glucocorticoids (83%) at low doses (10.0 [7.5; 20.0] mg/day prednisolone) in combination with hydroxychloroquine (80%) at a dose

of 200 mg/day. Immunosuppressants were used less frequently (in 36% of patients), mainly - mycophenolate mofetil (18%), cyclophosphamide, methotrexate and azathioprine in single cases. In addition, 13/76 (17%) patients were not receiving any therapy. Anti-B-cell biologic (mainly rituximab) according to the inclusion criteria were used more than 2 years ago in 8% of patients.
Fractures of various localizations were detected in 9% of SLE patients, OP was diagnosed in 7%pts, menopause - in 11% patients. Coverage by therapy was as follows: all patients with OP (100%) received vitamin D and 80% - anti-resorptive medications (bisphosphonates only).
IFNGS-high was detected in 72% of SLE patients. IFNGS-high patients were younger at the time of inclusion (31 [25; 41] and 40 [32; 49] years, p<0.05). We identified less hypertension (24% and 52%) and dyslipidaemia (13% and 38%) in IFGNS-high patients versus IFNGS-low patients with SLE(p<0.05). No association with incidence of OP, fractures, smoking, menopause, BMI, obesity, CVD, diabetes mellitus, chronic kidney disease was found with IFN. No effect of standard therapy for SLE on IFN-inducible genes expression was found.
Conclusions In SLE patients, IFN-I is independent of family history of autoimmune disease, any provoking factors, gender, weight, smoking, and any comorbidity. The lower incidence of hypertension and dyslipidemia in IFNGS-high patients is due to the younger age of them. Standard therapy has no significant effect on the expression of certain IFN-inducible genes.

P1446

THERMOGRAPHY IN THE SCREENING OF CHRONIC LOW BACK PAIN

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Objectives
The objective of this study is to evaluate the use of infrared thermography as a screening method in the clinical assessment of patients with chronic low back pain associated with musculoskeletal postural changes.
Material and Methods
Infrared thermography is a rapid, painless, radiation-free, and non-invasive method that enables the creation of a two-dimensional image of tissue physiology, detecting early metabolic and musculoskeletal alterations. Thermographic devices capture infrared radiation emitted by the body and convert it into electronic signals (LASANEN, 2015), generating images with temperature gradients in different colors based on standardized parameters of the BodyScan InfraRed Med® Sequence.
In this retrospective and analytical observational study, 138 patients with chronic low back pain who required evaluation in an orthopedic clinic between 2022 and 2024 were analyzed. Postural variations identified through thermographic examination included forward head posture, shoulder elevation, lumbar paravertebral muscle contraction, reduced lumbar curvature, lumbosacral mechanical overload, and abdominal muscle weakness.
Results
A total of 138 individuals diagnosed with chronic low back pain were evaluated, comprising 69.6% women and 30.4% men. Thermography revealed postural changes significantly when associated to chronic low back pain, with a statistically significant relevance ($p < 0.05$). This finding underscores the value of complementary screening or diagnostic methods, such as thermography, as many of the assessed changes involve inflammation or muscular hyperactivity. Thermography serves as a potentially useful tool for identifying thermal patterns consistent with these conditions.
Conclusion
Infrared thermography is an excellent method for screening musculoskeletal postural alterations in patients with chronic low back pain. It facilitates not only early treatment but also the identification of other hidden dysfunctions associated with long-term conditions.
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P1447

SARCOPENIA SCREENING IN PATIENTS WITH OSTEOPOROSIS AND OSTEOARTHRITIS

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Objective: To screen for sarcopenia in elderly patients being treated by a rheumatologist for a combination of osteoporosis (OP) and osteoarthritis (OA).
Methods: A survey was conducted among 146 outpatient patients older than 65 years, with an average age of 74±5.3 years, including 120 women and 26 men. The survey was carried out during an outpatient appointment with a rheumatologist using the SARS-F questionnaire for sarcopenia screening. The key to interpreting the test results is as follows: 0-3 points – no sarcopenia; more than 4 points – probable sarcopenia.
Results: The patients were divided into three groups:
- Group 1: OA + OP without fractures (52 patients: 52 women, 0 men)
- Group 2: OA + OP with fractures (38 patients: 32 women, 6 men)
- Group 3: OA without OP (56 patients: 26 women, 20 men)

Women predominated in all study groups. According to the survey results, the absence of sarcopenia was distributed as follows, both quantitatively and in percentage terms: Group 1 – 20 (38.5%), Group 2 – 8 (21%), Group 3 – 36 (64.3%). Accordingly, the probability of sarcopenia was as follows: Group 1 – 32 (61.5%), Group 2 – 30 (79%), Group 3 – 20 (35.7%).
In total, for patients with OA + OP (Group 1 + Group 2: 90 people), the probability of sarcopenia was detected in 62 (68.9%) patients, while 28 (31.1%) patients showed no signs of sarcopenia. In patients with OA alone, the probability of sarcopenia was found in 20 (35.7%) respondents, with 36 (64.3%) showing no signs

Conclusion: The probability of sarcopenia was lowest in men with OA without OP. Among women with OP and OA, the probability of sarcopenia was higher in the group with fractures. The number of patients with probable sarcopenia in the combination of OP and OA exceeded the number of those without sarcopenia according to the screening data. In contrast, in OA without OP, the opposite results were observed: the probability of sarcopenia was detected in a third of the respondents.

P1448

ADVERSE EFFECTS OF SARCOPENIA ON PATIENTS WITH OSTEOPOROSIS: AN AGE- AND SEX-MATCHED CROSS-SECTIONAL ANALYSIS

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Introduction
Understanding the relationship between osteosarcopenia, the risk of falls and fractures, daily living activities (ADL), and quality of life (QoL) is vital for identifying high-risk individuals and optimizing patient care. This research focuses on examining how muscle loss affects elderly patients with osteoporosis.
Materials and Methods
This cross-sectional study collected data from bone health assessments at a single medical center in Taipei, Taiwan, for patients aged 50 and above, between 2020 and 2022. We divided osteoporosis patients into two groups—those with sarcopenia and those without—matched by age and sex. Baseline characteristics, fall and fracture risks (using the STRATIFY scale and FRAX, respectively), ADL (assessed through the Barthel Index), and QoL (assessed through EQ5D3L) were compared between the two groups.
Results
The study included 200 osteoporotic patients, with 100 having sarcopenia and 100 without. The average age was 76.17 years, with females making up 82% of the cohort. In comparison with osteoporotic patients without sarcopenia, those with sarcopenia showed lower bone mineral density (T-scores: -3.64 vs. -3.28, $p = 0.002$), a higher fall risk (0.90 vs. 0.49, $p = 0.007$), greater risk for major osteoporotic fractures (21.25% vs. 17.97%, $p = 0.019$) and hip fractures (11.35% vs. 9.07%, $p = 0.014$), reduced functional independence (Barthel Index: 91.80 vs. 97.60, $p = 0.036$), and a diminished QoL (EQ5D3L: 0.93 vs. 0.96, $p = 0.036$).
Conclusions
Sarcopenia negatively impacts osteoporotic patients. The findings underscore the urgent need for early detection and appropriate interventions for sarcopenia in managing elderly patients with osteoporosis. These measures are crucial in improving patient outcomes and enhancing their QoL.

P1449

THE EFFECTS OF SARCOPENIA ON OUTCOMES FOLLOWING VERTEBRAL AUGMENTATION FOR OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURE: A META-ANALYSIS

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Background
Vertebral augmentation is a safe and effective treatment for osteoporotic vertebral compression fractures (OVCFs) in elderly patients. However, the role of muscle loss and reduced strength in post-procedure outcomes remains controversial. This meta-analysis investigates the impact of sarcopenia on clinical outcomes following vertebral augmentation in OVCF patients.
Materials and Methods
A systematic search of electronic databases was conducted up to August 2024 to identify studies comparing sarcopenic and non-sarcopenic patients who underwent kyphoplasty or vertebroplasty for OVCFs. The primary outcome analyzed was vertebral refracture, while secondary outcomes included residual back pain and mortality. The pooled results are reported as odds ratios (ORs) or mean differences with 95% confidence intervals (CIs).
Results
After a thorough screening, 14 studies were included, involving a total of 2197 OVCF patients treated with vertebral augmentation. Among these, 813 were sarcopenic, and 1384 were non-sarcopenic, with an average age of 73.06 years. Sarcopenic patients had a significantly higher risk of vertebral refracture compared to non-sarcopenic patients (OR: 2.92, 95% CI: 1.34-6.34, $p = 0.007$), with the risk increasing with age. Non-sarcopenic patients had a 64% lower likelihood of experiencing residual back pain than sarcopenic patients (OR: 0.36, 95% CI: 0.23-0.56, $p < 0.001$). Additionally, sarcopenic patients were found to have a significantly elevated risk of both 1-year mortality (OR: 30.65, 95% CI: 4.05-231.82, $p < 0.001$) and long-term mortality (OR: 14.4, 95% CI: 6.49-31.97, $p < 0.001$).
Conclusion
Sarcopenia negatively influences outcomes in patients undergoing vertebral augmentation for OVCFs. Early detection of sarcopenia in these patients, along with comprehensive strategies to improve and sustain muscle health, is recommended.

P1450

FACTORS INFLUENCE THE IMPACT OF INFLIXIMAB ON SERUM GLUCOSE STATUS IN RHEUMATOID ARTHRITIS PATIENT

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Background: Infliximab is one of biological agents that considered as a treat – to – target therapy for rheumatoid arthritis. Infliximab is not only show efficacy in improving clinical responses, reducing damages of main disease but also has affection on comorbid conditions, such as blood glucose management and there are some factors that altering this impact. **Objectives:** To describe some factors that have influenced impact of infliximab on blood glucose status in rheumatoid arthritis patients treated with infliximab within 3 months. **Methods:** 22 patients were diagnosed with rheumatoid arthritis and treated with infliximab for 3 months at Bach Mai Hospital's Rheumatology Department from January 2017 to December 2018. Quantification of fasting plasma glucose by quantitative hexokinase, quantification CRPhs by immunological methods of turbidity measurement and clinical assessment to calculate DAS 28 - CRP at each time of drug administration for 03 months. **Results:** Mean fasting plasma glucose decreased 24.8%, the difference was stastically significant with $p < 0.05$. The ability of elevated fasting plasma glucose of the group with disease active (DAS 28 – CRP ≥ 3.2) was 4.952 times higher than that of the group with disease remission (DAS 28 – CRP < 3.2), OR was stastically significant with CI = 95% (IQR 1.329 ÷ 18.452). The ability of elevated fasting plasma glucose of the group with medium dose of methylprednisolon (≥ 12mg) wais 6.840 times higher than that of the group with low dose of methylprednisolon (< 12mg), OR was was stastically significant with CI = 95% (IQR 2.075 ÷ 22.548). **Conclusion:** In addition to controlling and improving clinical symptomps of rheumatoid arthritis, infliximab also helps reduce fasting plasma glucose, in order to control serum glucose better, these effects were affected by DAS 28 – CRP and dose of methylprednisolon.

Keywords. *Rheumatoid arthritis, fasting plasma glucose, infliximab, DAS 28 – CRP, methylprednisolon*

P1451

EVALUATE THE SAFETY OF MESENCHYMAL STEM CELLS DERIVED FROM ALLOGENEIC UMBILICAL CORD TISSUE FROM NEWBORN UMBILICAL CORD TISSUE THERAPY IN THE TREATMENT OF KNEE OSTEOARTHRITIS

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Mesenchymal stem cells derived from allogeneic umbilical cord tissue from newborn umbilical cord tissue (hUCB-MSCs) have the following advantages: non-invasive collection, hyaline embryonic tissue structure similar to tendon, low immunogenicity, expected to treat knee osteoarthritis (OA) because of the ability to proliferate and differentiate into connective tissue cells, secrete immunoregulatory factors, anti-inflammatory, regenerative blood vessels, prevent apoptosis, but there are still many concerns about safety. **Objective**. Evaluate the safety of hUCB-MSCs therapy in treatment of primary OA. **Subjects and methods**. Prospective, open-label, placebo-controlled study on 65 patients with stage I-III OA according to Kellgren-Lawrence, 32 patients received intra-articular injection of hUCB-MSCs, 33 patients received hyaluronic acid. **Results**. The most common adverse event was pain at the time of injection with a rate of 40.6% in the study group and 36.4% in the control group, increased pain after injection was 37.5% and 6.3%, respectively, the difference was statistically significant with $p < 0.05$; there was no infection in the joint and soft tissue around the joint, post-injection joint bleeding, the level of post-injection effusion did not have a statistically significant difference in the 2 groups. **Conclusion**. Using hUCB-MSCs by intra-articular injection to treat OA is safe, however, research with larger sample sizes and longer follow-up time is needed for better evaluation. **Keywords**. Allogeneic mesenchymal stem cells from umbilical cord tissue, knee osteoarthritis, hyaluronic acid, safety.

P1452

COEXISTENT OF SPONDYLOARTHRITIS AND RHEUMATOID IN A SINGLE PATIENT: SERIES OF FIVE CASES

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Rheumatoid arthritis (RA) and Spondyloarthritis (SpA) are most common inflammatory joint diseases, which chronically progress to reduce physical fitness and joint function, leading to disability. Their manifestations, etiology, and genetic factors are distinctive, therefore cases of coexistence of RA and SpA are rare. In clinical practice, patients often present with symptoms typical of one disease, and later exhibit symptoms of another, both clinically and on imaging. This makes diagnosis and treatment more challenging. There were reports of similar cases since 1970s. There have

been reports of similar cases since the 1970s. This study aims to describe the clinical symptoms, laboratory tests, and imaging of five patients with a concomitant diagnosis of SpA and RA at Tam Anh General Hospital.

Keywords: Rheumatoid arthritis, Spondyloarthritis, coexistent, concomitant.

P1453

THE RELATIONSHIP OF OSTEOPOROSIS SCREENING WITH SOCIOECONOMIC STATUS

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Objective: Bone density screening for osteoporosis is recommended for all women in the U.S. by the age of 66 years. Our objective was to test the hypothesis that women with lower socioeconomic status were less likely to complete osteoporosis screening.

Material and Methods: We analyzed retrospective data from a large family medicine practice in the U.S. Midwest states of Minnesota, Wisconsin, and Iowa. All women empaneled in family medicine, aged 66 years and older in 2022, were eligible for inclusion. We collected data for any bone density testing completed in the 16 years between 2007 and 2022. Individual level housing-based socioeconomic status was determined with the HOUSES index, by linking patient addresses in the electronic health record to publicly available property data. The HOUSES index was stratified into quartiles, with Q1 representing the lowest socioeconomic status.

Results: Of the 11,196 women included, 8539 (76.3%) had completed at least one bone density measurement in the prior 16 years. Women who had completed bone density screening were younger (75.7±6.9 vs 78.4±8.5 years; P<0.001) and more likely to reside in urban (79.9% completion) than rural locations (73.0% completion; P<0.001). Women in the HOUSES Q1 were less likely to complete bone density screening (74.3%) compared with the Q4 (78.6%; P=0.007). Among women with specific social risk factors identified in the medical record, transportation risk was associated with a lower likelihood of completing screening (74.2% vs 81.8%; P=0.001), but food insecurity, limited financial resources, housing risk, and intimate partner violence risk were not.

Conclusion: Women with lower socioeconomic status in a U.S. Midwest primary care setting were less likely to complete bone density screening for osteoporosis than those of higher socioeconomic status. Strategies to make bone density screening more accessible and utilized by women with lower socioeconomic status and in rural areas are indicated.

P1455

CORRELATION BETWEEN NESFATIN-1 LEVELS, BODY COMPOSITION AND BONE METABOLISM MARKERS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Nesfatin-1 is a molecule associated with the melanocortin signaling system. The effects of nesfatin have been studied in the regulation of appetite, glucose and lipid metabolism, thermogenesis processes, the development of anxiety and depression, and the functioning of the cardiovascular and reproductive systems [1]. There is information regarding the pro-inflammatory activity of nesfatin-1 [2]. Among the pleiotropic effects of nesfatin, its osteogenic activity is noteworthy. In experiments on ovariectomized rats (OVX), intravenous administration of nesfatin for two months has been shown to increase bone mineral density (BMD) in the vertebrae and femur. Treatment of mouse pre-osteoblasts leads to enhanced differentiation and mineralization. Some inhibition of osteoclastogenesis has been observed in mice [3]. The degree of activity of bioactive molecules depends on the expression of target cells, and their functions may differ in health and disease.

Objective: To study the correlation of nesfatin-1 levels with BMD, body composition, and markers of bone formation and resorption in patients with rheumatoid arthritis (RA).

Materials and Methods: A total of 110 patients with RA were studied (mean age 54.07 ± 11.32; M ± Std.dev). The diagnosis of RA was established according to the ACR/EULAR criteria for RA (2010). All RA patients underwent examination using the LUNAR DPX-Pro densitometer and completed clinical and laboratory assessments. Serum levels of nesfatin-1 were measured using a commercial test system (RaiBiotech, cat. EIA-NESF) according to the instructions provided with the kit.

Results: The mean concentration of nesfatin-1 in RA patients was 50.49 ± 34.05 ng/mL. RA patients were divided into two groups: Group 1 (n = 44) with normal serum nesfatin-1 levels (<37.95 ng/mL) and Group 2 (n = 66) with elevated nesfatin-1 levels (>37.95 ng/mL). No differences were found in serum C-terminal collagen type I peptide levels between Groups 1 and 2. A statistically significant correlation was identified between nesfatin-1 and N-terminal propeptide of type I collagen (P1NP) (r = 0.218, p = 0.022). No significant relationships were noted between serum nesfatin-1 levels and BMD, muscle, or fat mass.

Conclusions: We did not find a relationship between elevated serum nesfatin-1 levels, BMD, and body composition in RA patients. However, we noted a correlation between nesfatin-1 and P1NP, indicating the influence of nesfatin-1 on the differentiation and function of osteoblasts.

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P1456

THE RELATIONSHIP OF NESFATIN-1 WITH BODY MASS INDEX AND FAT, BONE, AND MUSCLE MASS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Nesfatin-1 (NF-1), also known as nucleobindin 2 (NUCB2), is a neuroendocrine peptide involved in maintaining homeostasis through the regulation of metabolism, energy homeostasis, and food intake. Several studies have demonstrated that individuals with obesity, particularly those with morbid obesity, have higher serum levels of NF-1 compared to individuals without obesity, and it is associated with serum insulin levels, the Homeostasis Model Assessment of Insulin Resistance (HOMA-IR), and absolute and relative fat mass. However, there are also contradictory data in the international literature, where in a group of patients with obesity, serum levels of NF-1 were statistically significantly lower than in the group without obesity.
Objective of the study: To investigate the association of serum nesfatin-1 (NF-1) levels with body mass index (BMI), indicators of body composition, and rheumatoid cachexia (RC).
Materials and Methods:The study included 110 individuals with rheumatoid arthritis (RA) and 60 conditionally healthy subjects. A standard clinical and laboratory examination was conducted for all participants. The level of NF-1 was determined using an enzyme-linked immunosorbent assay (ELISA). Dual-energy X-ray absorptiometry (DEXA) was performed with the Total Body program.
Results:The level of NF-1 in the RA patient group was higher than in the conditionally healthy group (50.49 ± 34.05 vs. 31.61 ± 3.17 ng/ml, t = 4.28; Conclusion: Although we found a relationship between serum NF-1 levels and lean mass in specific areas in RA patients, this neuroendocrine peptide cannot be used as a marker for diagnosing RC. Further studies are needed to clarify the mechanism of the association between NF-1 levels and lean mass, which may contribute to the development of new approaches for monitoring this indicator.
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P1457

DEPENDENCE OF NESFATIN-1 ON BONE REMODELING INDICATORS

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INTRODUCTION: The role of nesfatin-1 in bone metabolism in health and disease is currently poorly understood. Although systemic inflammation is characteristic of most rheumatic diseases (RD), the pathological processes of bone metabolism are most pronounced in rheumatoid arthritis (RA).
OBJECTIVE : To investigate the relationship between nesfatin-1 levels, bone mineral density (BMD), and body composition.
METHODS: The study included 110 patients with RA (mean age 54.07 ± 11.32; M ± Std.dev) and 30 individuals in the control group. All RA patients underwent examination using dual-energy X-ray absorptiometry with an osteodensitometer, which determined body composition. Levels of nesfatin-1, bone metabolism markers, and vitamin D in serum were measured using an indirect solid-phase enzyme-linked immunosorbent assay with commercial test systems.
RESULTS: The mean concentration of nesfatin-1 in RA patients was 50.49 ± 34.05 ng/mL, which was significantly higher than that of healthy individuals. The average level of nesfatin-1 in the serum of healthy individuals was 31.61 ± 3.17 ng/mL (M ± σ). Based on these values, the reference range for nesfatin-1 in healthy individuals, defined as M ± 2σ, was from 25.27 to 37.95 ng/mL. According to nesfatin-1 levels, all RA patients were divided into two subgroups. Group 1 included patients (n = 44) with normal serum nesfatin-1 levels (less than 37.95 ng/mL), while Group 2 (n = 66) included those with elevated nesfatin-1 levels (greater than 37.95 ng/mL). The study did not reveal a significant correlation between nesfatin-1 levels and body composition in RA patients, nor were there any significant differences in serum C-terminal collagen type I peptide (β-CTx) levels between Groups 1 and 2. A statistically significant correlation was found between nesfatin-1 and N-terminal propeptide of type I collagen (P1NP) (r = 0.218, p = 0.022). No significant relationships were identified between serum nesfatin-1 levels and BMD at any site, nor was there a correlation between nesfatin-1 levels and muscle or fat mass in RA patients.
CONCLUSION: Thus, our study identified a relationship between nesfatin-1 and the marker of bone matrix formation (P1NP), indicating a possible influence of nesfatin-1 on the differentiation and function of osteoblasts.
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P1458

BABY-SHAKEN SYNDROME

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Shaking baby syndrome, shaken baby syndrome – injuries caused to the baby as a result of strong shaking. In total, there are about 27 cases of Baby-Shaken syndrome per 100,000 infants worldwide. Most often, the culprits of shaking are fathers and stepfathers (68-83%), followed by nannies (8-17%) and mothers (9-13%). A constantly crying child can infuriate even a well-balanced adult. A few sudden movements are enough for a child to get a serious injury. The head of a child under the age of one year is too large for a weak neck, it swings intensely and abruptly. Blood vessels can be damaged, leading to hemorrhages, due to the immaturity of the brain, the processes of nerve cells, which in children are not protected by the membrane, break off when shaken. In case of rough shaking of the baby, it is possible to separate the spinal cord from the brain at the level of the brainstem. The visual apparatus in infants is often affected, which is associated with the movement of the layers of the retina of the eye relative to each other. The classic triad of shaken baby syndrome is intracranial hemorrhage (predominantly subdural hematomas), cerebral edema, retinal hemorrhage. In 25% of cases, the shaking syndrome ends in the death of the infant from damage to vital brain centers, severe spinal injuries in the cervical spine. Complications of shaking syndrome include cortical blindness, hydrocephalus, convulsive seizures, cerebral palsy, delayed psychospeech and motor development, learning disabilities, and mental retardation. In the mildest cases, symptoms of severe brain dysfunction remain. In the clinic, we observed a case of Baby-Shaken syndrome in a 4-month-old child. The child was born from a second pregnancy due to grade 1 gestational anemia, colpitis, chronic nicotine intoxication, second vaginal birth at 37 weeks with a weight of 3.100 grams. The child's father is 53 years old, the mother is 29 years old, the mother suffers from epilepsy. From the age of 2 months, the baby began to hold his head.
At the age of 4 months, the child was admitted to inpatient treatment with complaints from the parents of a short-term loss of consciousness against the background of crying, similar to a respiratory affective attack. During the examination of the child, no data on cranial nerve damage were revealed, tendon-periosteal reflexes were not altered, a large fontanelle 1.5x1.5 cm, not strained. He holds his head while lying on his stomach well. Support on the forefoot. No changes in blood tests were detected. The child underwent an ultrasound of the brain - an echo picture of a subdural ganglion cyst on the right, an X-ray of the skull in 2 projections - no violation of the integrity of the bones of the cranial vault was revealed. The child underwent an MRI of the brain, revealed subacute chronic subdural liquor-hemorrhagic clusters over both hemispheres of the brain and cerebellum in varying degrees of resolution, the largest in the frontal region - 12 mm thick, in the posterior cranial fossa 2-3 mm thick with a shift of the median structures to the right at the level of the ventricles by 1.5-2 mm without compression of the brain. Mild expansion of the subarachnoid convexital and cisternal spaces of the brain. The ventricles of the brain are not dilated or deformed, the anterior horns of the lateral ventricles are at the level of the foramen of Monroe 6 and 4 mm, the width of the third ventricle is 5 mm, the width of the fourth ventricle is 12 mm. There is no occlusion of the cerebrospinal fluid pathways. He was examined by a neurosurgeon and diagnosed: Bilateral subdural cerebrorogemorrhagic clusters (Baby-Shaken syndrome). Given the absence of focal symptoms and signs of intracranial hypertension, surgical treatment is not currently required. Conservative treatment with glycine and magnetab was carried out.
Examined by a VisOD|OS-object vision, the optic nerve discs on the fundus of the eye are normal, no pathology was detected at the time of examination. The child's parents are registered as socially dangerous, for more frequent visits by the district pediatrician and visiting nurses. The inadmissibility of rough shaking and other options for careless treatment of children, the involvement of relatives in caring for the baby, and the help of psychologists are explained

P1459

REHABILITATION OF CHILDREN WITH CEREBRAL PALSY AND CONVULSIVE SYNDROME AT THE MINSK REGIONAL CHILDREN'S CLINICAL HOSPITAL

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Children with cerebral palsy (ICP) undergo courses of rehabilitation: medication and physiotherapy, massage repeatedly, sometimes up to 10 courses on the basis of the neurology departments of the Minsk Regional Children's Clinical Hospital (MRCH). Comprehensive rehabilitation is aimed at restoring motor functions, normalizing muscle tone, normalizing or developing weakened or absent innate motor reflexes (stepping, protective, head-to-body, head-to-head reflex, support reflex), teaching the skills of sitting, standing, walking, manipulative activity, and speech functions.
In the presence of convulsive syndrome, the selection of anticonvulsants is carried out: carbamazepine, depakine, convulsofin, lamictal, topamax, clonazepam in mono- or in case of ineffectiveness in duotherapy. The presence of convulsive seizures in a patient with cerebral palsy is a contraindication to physiotherapeutic treatment (FTL), therapeutic exercise (exercise

therapy), massage, drug treatment has a number of limitations - a number of nootropic drugs that can provoke convulsive seizures are contraindicated: nootropics (aninalone, cerebrolysin, encephalobol, piracetam), anticholinesterase drugs: proserin, neuromidine. Of the nootropic and vascular drugs, pantogam, gliatilin, cortexin, actovegin, emoxipine, mexibel, glycine, B vitamins (neurobex, magne-B6), vitamin E, muscle relaxants (midocalm) are used.

In the absence of convulsive syndrome in children with cerebral palsy for 3 months, the patient begins to undergo FTL, exercise therapy, massage, acupuncture against the background of taking anticonvulsants. Anticonvulsants are taken for a long time – 2-3 years after the last attack. Massage is of particular importance for the treatment of cerebral palsy, the work with each muscle group should be approached selectively, taking into account its tone, the presence of contractures in the joints. Physiotherapeutic treatment includes electrotherapy: electrical stimulation of the back muscles, foot extensors, thigh muscles, buttocks; Phototherapy: UV, laser therapy, polarized light therapy, ultrasound therapy and drug phonophoresis: euphylline-dibazole biphoresis on the limbs and segments of the spinal cord, heat therapy (paraffin-ozokerite applications), hydrotherapy: hydromassage, whirlpool baths, reflexology.

As of January 1, 2012, there are 857 children with cerebral palsy in the Minsk region. In 2011, 226 patients with cerebral palsy (29.65% of morbidity) were treated at the Neurology Department. 47 case histories of children with cerebral palsy who underwent treatment in 2011 were analyzed. Convulsive seizures were observed in 18 patients (38%) In 3 patients (6%) children with cerebral palsy, convulsive seizures in the stage of drug remission (that is, they regularly take anticonvulsants), sulorogenic seizures were noted during the rehabilitation treatment, as a result of which rehabilitation by physiotherapeutic methods, massage was stopped, only permissible drug treatment was preserved.

P1460

INCIDENCE OF FRACTURES IN PATIENTS WITH TYPE 1 AND TYPE 2 DIABETES MELLITUS: A SURVIVAL ANALYSIS

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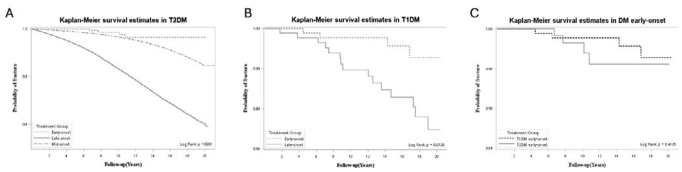
Objective(s): This study aims to investigate the incidence of fractures in patients with Type 1 Diabetes Mellitus (T1DM) and Type 2 Diabetes Mellitus (T2DM), focusing on the influence of age at diabetes onset.

Material and Methods: Data were extracted from the Longitudinal Generation Tracking Database 2000 (LGTD 2000), covering the years 2000 to 2019. Patients were categorized based on diabetes type and age at diagnosis. Fracture incidence was assessed using Kaplan-Meier survival analysis, with specific attention to the time-to-event relationships.

Results: A total of 988 patients with T1DM and 146,549 with T2DM were included in the analysis. The average follow-up duration was 13.33 ± 5.98 years for T1DM, revealing fracture rates of 0.8% for early-onset and 3.2% for late-onset. In the T2DM cohort, fracture rates were reported at 0.8%, 2.9%, and 10.7% across early, mid-, and late-onset subgroups, respectively. Late-onset groups exhibited a steeper increase in fracture risk over time, but no significant difference in risk was found between early-onset T1DM and T2DM patients (Fig. 1).

Conclusion(s): This study highlights the temporal relationship between diabetes onset age and fracture incidence, demonstrating that late-onset diabetes significantly increases fracture risk. Understanding these dynamics may aid in developing effective fracture prediction and prevention strategies for diabetes patients.

Disclosures: The authors declare that they have no conflict of interest.



P1461

EARLY MENOPAUSE AND FRACTURE RISK: A RETROSPECTIVE ANALYSIS IN TAIWAN

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Objective

To analyze the impact of early menopause on fracture risk in women and to investigate the potential roles of chronic diseases and bone density in this process.

Methods

This retrospective study included women who underwent their first bone density examination at Taichung Veterans General Hospital between January 2010 and December 2024. Among the participants, 530 women experienced early menopause (EMP group), and 1,883 women underwent normal menopause (NMP group). Data were collected on menopause age, age at fracture, bone density, and the prevalence of chronic diseases before fracture. Statistical analyses, including the Mann-Whitney U test, Chi-square test, and logistic regression, were used to examine the relationship between EMP and fracture risk.

Results

This study found that women with early menopause (EMP) had a significantly younger age of fracture onset compared to those with normal menopause (NMP) (67.5±9.6 vs 70.3±8.4 years, p<0.001), and the proportion of fractures occurring before the

age of 65 was significantly higher in the EMP group than in the NMP group (38.7% vs 27.5%, p<0.001). In addition, EMP women were more likely to have pre-fracture chronic diseases such as hypertension, diabetes, and chronic kidney disease, with prevalence rates significantly higher than those in NMP women (p<0.01). Multivariate logistic regression analysis showed that EMP was an independent risk factor for fractures (adjusted OR=1.89, 95%CI: 1.52-2.34, p<0.001). Other significant risk factors included hypertension (OR=0.40, 95%CI: 0.32-0.51, p<0.001), coronary artery disease (OR=0.62, 95%CI: 0.48-0.80, p=0.003), and rheumatoid arthritis (OR=1.64, 95%CI: 1.22-2.22, p=0.001). After adjusting for vitamin D and calcium supplementation, the fracture risk in the EMP group remained significantly higher than in the NMP group (OR=1.69, 95%CI: 1.38-2.07, p<0.001).

Conclusion

These findings highlight that EMP is significantly associated with an increased fracture risk, particularly in women under 65 years of age. The coexistence of chronic diseases such as hypertension, coronary artery disease, and rheumatoid arthritis further exacerbates this risk. These results emphasize the importance of bone health management and early intervention for chronic diseases in women with EMP to reduce fracture incidence.

P1462

GERIATRIC SYNDROMES IN OSTEOPOROTIC AND OSTEOPENIC ELDERLY PATIENTS

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Objective: Geriatric syndromes (GS) are clinical conditions associated with aging. Osteoporosis, linked to almost all GS, increases 1.2-2.5 times in individuals over 65. Early diagnosis of osteoporosis and GS is crucial, as they lower quality of life, increase healthcare use and raise morbidity and mortality. This study investigates GS related to osteoporosis and osteopenia in the elderly.

Methods: The study included 64 patients aged 65 and above, diagnosed with osteoporosis (Dual-energy x-ray absorptiometry [DEXA] T score <-2.5) and osteopenia (DEXA T score between -1 and -2.5). Exclusion criteria were acute organ failure, chronic diseases, musculoskeletal or neurological disorders and mobility limitations. Nutritional status was assessed using the Mini Nutritional Assessment (MNA) (<24 impaired nutritional status), sarcopenia was evaluated with the SARC-F questionnaire (≥4 possible sarcopenia) and handgrip test (woman <16, man <27 possible sarcopenia), frailty with the Frail scale (robust [0 score], pre-frail [1-2 score], frail [≥3 score]), depression with Geriatric Depression Scale (GDS) (>5 depression). Data were analyzed with IBM SPSS Statistics version 26 (p<0.05).

Results: In the osteoporosis group, the female/male (F/M) ratio was 30/4, and the average age was 78.09 ± 5.11 years. In the osteopenia group, the F/M ratio was 25/5, and the average age was 76.4 ± 5.70 years (p: 0.72, 0.21 respectively). The MNA score in the osteoporosis group was 24.24 ± 3.27, and in the osteopenia group, it was 23.72 ± 3.98 (p: 0.56). Handgrip strength was 20/24.5 (p: 0.10), and the average SARC-F score was 3/2 (p: 0.49). Depression was found in 9 individuals in the osteoporosis group and 11 in the osteopenia group (p: 0.61). Frailty assessment showed 15 pre-frail and 10 frail patients in the osteoporosis group, compared to 11 pre-frail and 10 frail patients in the osteopenia group (p: 0.62).

Conclusion: Osteoporosis is a geriatric syndrome linked to other geriatric conditions. In our study, although the MNA score and handgrip strength were lower and the SARC-F score and the number of frail patients were higher in the osteoporosis group, no statistical significance was found. This may be due to the small sample size, and larger studies are needed.

P1463

ATYPICAL FRACTURES IN PATIENTS ON DENOSUMAB THERAPY FOR OSTEOPOROSIS

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Objectives:

Our objective was to identify patients with Atypical Femoral Fracture (AFF) on denosumab therapy and report on patient features and management.

Material and Methods:

Atypical femoral fractures (AFFs) are rare in the treatment of osteoporosis and occur in about 1/1000 patients on long-term bisphosphonate therapy. However, the occurrence of AFF in patients on denosumab is much less frequent with the vast majority having prior bisphosphonate treatment. We identified 4 patients with AFF on denosumab therapy and analysed each case.

Results:

Two patients were bisphosphonate naïve and had no prior fractures: one was on denosumab for 8 years and her most recent lowest T-score was -1.0. Her denosumab was stopped and she was monitored. The other was on denosumab for 4 years and had a lowest T-score of -2.2 (lumbar spine). After MRI femur ruled out a contralateral incomplete AFF, he was treated with zoledronic acid (4mg) six months after his last denosumab injection. Two patients had prior bisphosphonate therapy and presented with complete AFF. One is being monitored closely and the other was treated with zoledronic acid 9 months after her last denosumab injection (contralateral incomplete AFF first excluded).

Conclusion:

AFF is rare on denosumab with the optimal future treatment strategy unclear. However, up to 15- 30% of all AFFs occur in patients not on antiresorptives. In those at high risk of bone loss and fracture, further treatment with bisphosphonates should be considered (ECTS guidelines). In those with AFF and at very high risk of rebound fracture (low spine T-scores and recent vertebral fractures), continuing denosumab and adding in teriparatide might also be a potential strategy but data is lacking.

P1464

IN-HOSPITAL MORTALITY OF FRAGILITY HIP FRACTURE IN OLDEST-OLD PATIENTS

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Background: With an aging population, hip fractures in the elderly have become a growing concern. Oldest-old patients aged 80 years and above are particularly vulnerable to complications and in-hospital mortality. This study aimed to determine the prevalence of in-hospital mortality and identify associated risk factors in Oldest-old patients with hip fractures.
Methods: This retrospective cohort study analyzed data from a hip fracture database at Maharat Nakhon Ratchasima Hospital from January 2020 to December 2021. Patients aged 80 years and above were included. Statistical analysis was performed to compare characteristics between patients who died and survived during hospitalization.
Results: A total of 485 patients aged 80 years and above were included. The in-hospital mortality rate was 5.52%. Renal dysfunction was significantly associated with increased mortality. Patients who died had significantly higher creatinine levels and lower estimated glomerular filtration rates (eGFR) compared to survivors. Moreover, 25% of deceased patients had stage 4 or higher chronic kidney disease (CKD) or eGFR less than 30 ml/min/1.73 m², compared to 8.27% of survivors. Postoperative pneumonia was another significant complication observed in the deceased group.
Conclusion: Elderly hip fracture patients aged 80 years and above have a high risk of in-hospital mortality. Renal dysfunction and postoperative pneumonia were identified as significant risk factors. Proactive assessment and management of these risk factors may help reduce mortality in this vulnerable population.

Keywords: Elderly, Oldest-old, Hip fracture, In-hospital mortality, Risk factors, Osteoporosis, Renal dysfunction, Pneumonia

P1465

CONCENTRATION OF SERUM ANGIOPOIETIN-LIKE PROTEINS DEPENDING ON THE SEVERITY OF METABOLIC DISORDERS IN PATIENTS WITH PSORIATIC ARTHRITIS

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Increased levels of angiopoietin-like proteins of various types are detected in serum in the presence of a number of signs of metabolic syndrome (MS) (hyperlipidemia, hyperinsulinemia, arterial hypertension, obesity, endothelial dysfunction, etc.).
Purpose of the study:
To determine the clinical and laboratory relationship between serum angiopoietin-like proteins (types 3, 4 and 6) and the patterns of metabolic disorders in PsA patients.
Materials and Methods.
The content of serum Angptl types 3, 4 and 6 was studied in 45 PsA patients (women 55.6%) using immunoassay method.
Results and Discussion.
The content of Angptl of different types depending on the presence or absence of MS in patients with PsA is presented in the Table.
Table.
Content of Angptl types 3,4 and 6 in PsA patients depending on MS

Indices	Patients with MS (n=27)	Patients without MS (n=18)
Angptl3, pg/mL	1113 ± 372	1024 ± 311
Angptl4, pg/mL	402 ± 188	362 ± 149
Angptl6, pg/mL	5,45[4,1;6,9]	4,04[3,5;4,6] #

Note: # - p<0.05.
When patients with PsA were categorized by presence/absence of MS according to the International Diabetes Federation (IDF) criteria, MS was diagnosed in 60% of cases. Intergroup comparison of Angptl indices demonstrated an increase in Angptl6 levels in the presence of MS (M-W U test, p=0.018) and showed no difference in Angptl 3 and 4 types. Only in the group of patients with low-activity PsA in the presence of MS was an increase in Angptl3 levels observed (Newman-Keuls test; p=0.49) when compared with patients without MS.
In the general group of PsA patients, the main laboratory indicators of MS (blood glucose level, HDL-cholesterol, blood triglycerides(TG)) in the constructed regression model described an association with Angptl3 within 10% (R2=0, 099, p=0.22), with Angptl6 within 15% (R2=0.148, p=0.08) and with Angptl4 around 17% (R2=0.168, p=0.05), with TG values making the main contribution (β=0.33, p=0.04; β=0.31, p=0.044; β=0.32, p=0.037; for Angptl 3, 4 and 6, respectively).
Conclusions.
Angptl types 3,4 and 6 can be used as diagnostic markers of metabolic disorders in PsA patients.

P1466

KINETICS AND CONCENTRATIONS OF CIRCULATING 25-HYDROXYVITAMIN D (25-OH D) USING HIGH-, MEDIUM-, AND LOW-DOSE REGIMENS

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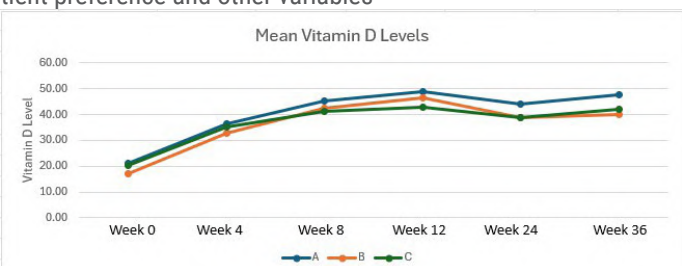
Objectives: Vitamin D deficiency is widespread, but guidelines for vitamin D replacement therapy in Armenia are not clearly defined. This study aimed to investigate the efficacy of three administration regimens to replete vitamin D: low dose - high frequency; medium dose - medium frequency; high dose - low frequency.
Material and Methods: We recruited community dwelling adults in Yerevan, Armenia, who were found to be deficient in vitamin D. Participants were subsequently randomized to receive vitamin D according to one of three arms: A) 7 000 IU via oral drops daily for 12 weeks followed by 3 500 IU daily for 24 weeks; B) 50 000 IU oral solution weekly for 12 weeks followed by 25 000 weekly for 24 weeks; and C) 100 000 IU every other week for 12 weeks, followed by 50 000 every other week for 24 weeks. After 36 weeks, all subjects received the same amount of vitamin D. Levels of 25-OH D were measured at baseline and then at weeks 4, 8, 12, 24, and 36.
Results: The mean baseline 25-OH D level of the 60 adults who participated in the study (average age 46, 80% female), was 19.37 ng/mL. All three arms showed statistically significant increases in 25-OH D levels from baseline to 4 weeks, and again from 4 to 8 weeks, after which levels plateaued in the mid-40s for all groups. Group A had slightly higher mean 25-OH D level than Group B at baseline (21.03 vs 16.94, *p*-value 0.03) as well as at week 36 (47.71 vs 40.19, *p*-value 0.007); otherwise there were no significant differences between the groups at any other time points.
Conclusion: This study supports a recommendation that different dosing regimens of vitamin D replacement will reach similar, desirable levels when steady state is reached at weeks 12 to 36, thus enabling health care providers an option to determine the most appropriate replacement strategy based on individual patient preference and other variables



P1467

MACROELEMENTAL COMPOSITION OF THE MANDIBULAR RAMUS IN WHITE RATS WITH A DEFECT IN THE TIBIA AFTER 60-DAY TARTRAZINE INTAKE

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Objective: The aim of the study is to analyze macroelemental composition of the mandibular ramus in white rats with a defect in the tibia after 60-day tartrazine intake. Material and Methods: 140 male rats with the body weight of 200-210 grams were distributed into four groups like the following: group 1 - controls, group 2 - animals that received per os tartrazine in dosage of 1500 mg/kg of body weight for 60 days, group 3 - animals with tibia fracture (modeled as 2.0 mm reach-through round opening between the proximal metaphysis and the shaft), and group 4 - animals with tibia fracture and administration of tartrazine. Upon expiration of observation terms (the 3rd, the 10th, the 15th, the 24th, and the 45th day), rami of the mandible were prepared for chemical analysis. Results: In the group 2 calcium level and calcium/phosphorus ratio in the mandibular ramus in the period from the 3rd to the 45th day were lower than those of the group 1 by 5.27%, 9.13%, 8.66%, 11.59% and 4.42%, and by 9.70%, 13.56%, 11.59%, 12.51% and 3.43% respectively. In the group 3 calcium level and calcium/phosphorus ratio in the mandibular ramus in the period from the 3rd to the 24th day were lower than those of the group 1 by 5.12%, 6.72%, 8.70% and 11.81%, and by 5.12%, 11.50%, 11.79% и 12.73% respectively. In the group 4 calcium level and calcium/phosphorus ratio in the mandibular ramus by the 45th day were lower than those of the group 2 by 5.16% and 6.59%. Conclusion: Intragastric administration of tartrazine in dosage of 1500 mg/kg/d for 60 days was accompanied by destabilization of the mandibular ramus macroelemental composition. Tibia fracture after 60-day tartrazine intake administration was accompanied by aggravation of the destabilization of the mandibular ramus macroelemental composition.

P1468

THE CHARACTERISTICS, ADHERENCE AND TREATMENT PATTERNS OF MEN TREATED FOR OSTEOPOROSIS IN JAPAN: A RETROSPECTIVE COHORT STUDY

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Objective:
Osteoporosis (OP) is underdiagnosed and more poorly managed among men than among women[1]. The objective of this study was

to assess the characteristics, adherence and treatment patterns of men treated for osteoporosis in Japan.

Material and Methods:

This retrospective cohort study was conducted using the MDV hospital-based and DeSC payer-based claims databases in Japan. Men aged ≥50 years were included upon initiation of a new OP treatment, including romosozumab, parathyroid hormone (PTH) analogs (teriparatide, abaloparatide), denosumab, or oral bisphosphonates (BPs; alendronate, ibandronate, risedronate), between Jan 1, 2019 and Aug 31, 2023 (DeSC) or Dec 31, 2023 (MDV). Patients were excluded if they had <15 months enrolment, received a cancer diagnosis within ≤3 months prior or were diagnosed with Paget's disease or metastatic cancer at any time prior to index date. Adherence to treatment was estimated using proportion of days covered (PDC), calculated as the total number of days of supply divided by the patient's follow-up time.

Results:

DeSC patients were on average older than MDV patients, and patients on Oral BPs were the youngest in both data sets. Use of previous OP treatment was highest among denosumab users, and history of any fracture was highest in PTH analog users. Recent history of myocardial infarction and stroke was similar across treatment groups, but slightly lower for romosozumab and denosumab users. Patients using PTH analogs and romosozumab had a greater history of hospitalizations in DeSC and MDV, respectively. Adherence to treatment was highest among users of denosumab, followed by users of romosozumab, PTH analogs and oral BPs (12-month mean PDC in DeSC: 87.4%, 72.9%, 70.8% and 57.6% respectively).

Conclusions:

Across 2 data systems in Japan, close to two thirds of men using PTH analogs and romosozumab experienced any fracture within 15 months prior to initiating treatment. In contrast, recent history of cardiovascular disease was similarly low across all treatment groups, though slightly lower in romosozumab and denosumab users in both databases.

Table 1: Characteristics of male patients initiating osteoporosis treatments in Japan

Description*	DeSC database				MDV database			
	Romosozumab (n=5,420)	PTH Analogs (n=12,069)	Denosumab (n=11,497)	Oral BP (n=30,595)	Romosozumab (n=2,697)	PTH Analogs (n=7,410)	Denosumab (n=7,775)	Oral BP (n=35,690)
Age, Mean(SD)	82.3 (7.4)	82.1 (7.5)	82.1 (7.7)	79.5 (8.8)	78.5 (8.9)	78.4 (9.2)	78.4 (9.2)	76.4 (9.8)
12-month PDC, mean % (SD)	72.9% (32.8)	70.8% (33.4)	87.4% (19.3)	57.6% (37)	78.3 (30.3)	63.5 (33.1)	90.1 (17.2)	52.7 (38.4)
History of Any fracture	3510 (64.9%)	8501 (70.4%)	5107 (44.4%)	11236 (36.7%)	1597 (59.2%)	4727 (63.8%)	2496 (32.1%)	8552 (24%)
Vertebral fracture	2957 (54.6%)	6764 (56%)	3760 (32.7%)	7504 (24.5%)	1269 (47.1%)	3474 (46.9%)	1767 (22.7%)	4542 (12.7%)
Hip fracture	400 (7.4%)	1023 (8.5%)	905 (7.9%)	2725 (8.9%)	215 (8%)	681 (9.2%)	516 (6.6%)	3372 (9.4%)
Non-hip, non-vertebral fracture	614 (11.3%)	1766 (14.6%)	1052 (9.2%)	2328 (7.6%)	255 (9.5%)	1072 (14.5%)	442 (5.7%)	1369 (3.8%)
History of any OP treatment	1525 (28.1%)	1412 (11.7%)	4830 (42%)	2646 (8.6%)	764 (28.3%)	697 (9.4%)	2769 (35.6%)	1415 (4%)
Oral bisphosphonates	526 (9.7%)	859 (7.1%)	1361 (11.8%)	0 (0%)	339 (12.6%)	531 (7.2%)	1097 (14.1%)	0 (0%)
IV bisphosphonates	263 (4.9%)	333 (2.8%)	734 (6.4%)	569 (1.9%)	74 (2.7%)	52 (0.7%)	179 (2.3%)	143 (0.4%)
Romosozumab	0 (0%)	94 (0.8%)	1228 (10.7%)	379 (1.2%)	0 (0%)	54 (0.7%)	640 (8.2%)	213 (0.6%)
Denosumab	213 (3.9%)	173 (1.4%)	0 (0%)	363 (1.2%)	100 (3.7%)	74 (1%)	0 (0%)	183 (0.5%)
Zoledronic acid	17 (0.3%)	19 (0.2%)	66 (0.6%)	50 (0.2%)	7 (0.3%)	10 (0.1%)	52 (0.7%)	21 (0.1%)
Teriparatide	644 (11.9%)	0 (0%)	1894 (16.5%)	1410 (4.6%)	284 (10.5%)	0 (0%)	1023 (13.2%)	901 (2.5%)
History of CV events and related comorbidities								
Recent MI (within 12 months prior to index date)	23 (0.4%)	98 (0.8%)	79 (0.7%)	205 (0.7%)	8 (0.3%)	41 (0.6%)	24 (0.3%)	223 (0.6%)
Recent stroke (within 12 months prior to index date)	173 (3.2%)	558 (4.6%)	403 (3.5%)	1257 (4.1%)	57 (2.1%)	245 (3.3%)	155 (2.0%)	1117 (3.1%)
Hypertension	1774 (32.7%)	4220 (35%)	3652 (31.8%)	10981 (35.9%)	719 (26.7%)	2543 (34.3%)	1784 (22.9%)	11323 (31.7%)
Hyperlipidemia	654 (12.1%)	1575 (13%)	1425 (12.4%)	4759 (15.6%)	191 (7.1%)	807 (10.9%)	562 (7.2%)	4209 (11.8%)
Number of hospitalizations								
0	2508 (46.27%)	4487 (37.18%)	5847 (50.86%)	12591 (41.15%)	1434 (53.17%)	4444 (59.97%)	4623 (59.46%)	23569 (66.04%)
1-2	1403 (25.89%)	3815 (31.61%)	2672 (23.24%)	10194 (33.32%)	1114 (41.31%)	2599 (35.07%)	2728 (35.02%)	10684 (29.94%)
3-4	671 (12.38%)	1769 (14.66%)	1278 (11.12%)	3733 (12.2%)	120 (4.45%)	317 (4.28%)	347 (4.46%)	1192 (3.34%)
5+	838 (15.46%)	1998 (16.55%)	1700 (14.79%)	4077 (13.33%)	29 (1.08%)	50 (0.67%)	82 (1.05%)	245 (0.69%)

*Patient characteristics were observed during a 15- month baseline period, unless otherwise specified.
CV: Cardiovascular, IV: intravenous, PDC: proportion days covered, SD: standard deviation

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P1469

THE CHARACTERISTICS, ADHERENCE AND TREATMENT PATTERNS OF WOMEN TREATED FOR OSTEOPOROSIS IN JAPAN: A RETROSPECTIVE COHORT STUDY

V. C. Brunetti[1], C.-H. S. Chang[2], S. Komatsu[2], G. Papageorgiou[1], K. De Silva[1], M. Kim[3], M. Hatano[4]

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Objective:

The objective of this study was to assess the patient characteristics, adherence and treatment patterns of women treated for osteoporosis (OP) in Japan.

Material and Methods:

This retrospective cohort study was conducted using the MDV hospital-based and DeSC payer-based claims databases in Japan. Women aged ≥50 years were included upon initiation of a new OP treatment, including romosozumab, parathyroid hormone (PTH) analogs (teriparatide, abaloparatide), denosumab, or oral bisphosphonates (BP; alendronate, ibandronate, risedronate), from Jan 1st 2019 until Aug 31st 2023 (DeSC) or Dec 31st 2023 (MDV). Patients were excluded if they had <15 months enrolment, received a cancer diagnosis within ≤3 months prior or were diagnosed with Paget's disease or metastatic cancer at any time prior to index date. Adherence to treatment was estimated using proportion of days covered (PDC), calculated as the total number of days of supply divided by the patient's follow-up time.

Results:

A total of 45,177 romosozumab initiators, 66,080 PTH analogs initiators, 97,163 denosumab initiators and 154,845 oral BP initiators were included from the DeSC data (Table 1). Patients were on average younger in the MDV data, and users of oral BPs were the youngest in both databases. In both MDV and DeSC, PTH analog users had a greater history of fracture, while denosumab users had a greater history of any OP treatment use. History of recent myocardial infarction and stroke was similar across treatment groups, although slightly lower among patients using romosozumab or denosumab. In both databases, adherence to treatment was highest among users of denosumab, followed by users of romosozumab, PTH analogs and oral BPs.

Conclusions:

Across 2 data systems in Japan, approximately half of women with OP using PTH analogs and romosozumab experienced any fracture within 15 months prior to initiating treatment. In contrast, recent history of cardiovascular disease was similarly low across all treatment groups, though slightly lower in romosozumab and denosumab users in both databases.

Table 1: Characteristics and adherence of female patients initiating osteoporosis treatments in Japan

Description	DeSC database				MIV database			
	Romosozumab (n=45,177)	PTH Analogs (n=66,080)	Denosumab (n=97,163)	Oral BP (n=154,845)	Romosozumab (n=19,083)	PTH Analogs (n=30,511)	Denosumab (n=49,688)	Oral BP (n=113,767)
Age, Mean(SD)	81.6 (7.1)	81.5 (7.6)	81.7 (7.6)	79.2 (8.5)	78.3 (8.4)	79 (8.8)	78.2 (9)	77.8 (9.9)
12-month PDC, mean % (SD)	77.8 (31)	72.2 (33.5)	89.8 (17.5)	58.3 (38)	81.3 (28.8)	62.9 (33.2)	92.3 (15)	43.4 (38.6)
History of any fracture	23211 (51.4%)	40659 (61.5%)	32000 (32.9%)	51274 (33.1%)	8481 (44.2%)	17685 (58%)	12087 (24.3%)	33118 (29.1%)
Vertebral fracture	16847 (37.3%)	28667 (43.4%)	20244 (20.8%)	28096 (18.1%)	5616 (29.4%)	10811 (35.4%)	7098 (14.3%)	13845 (12.2%)
Hip fracture	3381 (7.5%)	6189 (9.4%)	5752 (5.9%)	12612 (8.1%)	1516 (7.9%)	3595 (11.8%)	2548 (5.1%)	12999 (11.4%)
Non-hip, non-vertebral fracture	6446 (14.3%)	12115 (18.3%)	10407 (10.7%)	17237 (11.1%)	2291 (12%)	5689 (18.6%)	3683 (7.4%)	9571 (8.4%)
History of any osteoporosis-related medication	22504 (49.8%)	22526 (34.1%)	56572 (58.2%)	33346 (21.5%)	8064 (42.3%)	6144 (20.1%)	22882 (46.1%)	11182 (9.8%)
Oral bisphosphonates	7807 (17.3%)	10947 (16.6%)	17968 (18.5%)	0 (0%)	3272 (17.1%)	3801 (12.5%)	8226 (16.6%)	0 (0%)
IV bisphosphonates	4231 (9.4%)	4589 (6.9%)	10077 (10.4%)	6695 (4.3%)	617 (3.2%)	352 (1.2%)	1522 (3.1%)	799 (0.7%)
Romosozumab	0 (0%)	927 (1.4%)	12853 (13.2%)	3065 (2%)	0 (0%)	345 (1.1%)	5723 (11.5%)	1471 (1.3%)
Denosumab	3684 (8.2%)	2262 (3.4%)	0 (0%)	3950 (2.6%)	1511 (7.9%)	694 (2.2%)	0 (0%)	1406 (1.2%)
Zoledronic acid	235 (0.5%)	176 (0.3%)	616 (0.6%)	226 (0.2%)	143 (0.7%)	82 (0.3%)	388 (0.8%)	131 (0.1%)
Teriparatide	5708 (12.6%)	0 (0%)	16757 (16.7%)	8869 (5.7%)	2238 (11.7%)	0 (0%)	7391 (14.9%)	4517 (4%)
Raloxifene	1964 (4.3%)	2938 (4.4%)	3932 (4%)	6781 (4.4%)	494 (2.6%)	589 (1.9%)	1095 (2.2%)	1761 (1.5%)
Bazedoxifene	2197 (4.9%)	3967 (6.5%)	4244 (4.4%)	6918 (4.5%)	634 (3.3%)	698 (2.3%)	1224 (2.5%)	1758 (1.5%)
History of CV events and related comorbidities								
Recent MI (within 12 months prior to index date)	60 (0.1%)	208 (0.3%)	227 (0.2%)	346 (0.2%)	18 (0.1%)	83 (0.3%)	63 (0.1%)	337 (0.3%)
Recent stroke (within 12 months prior to index date)	746 (1.7%)	1636 (2.5%)	1704 (1.8%)	2987 (1.9%)	194 (1%)	657 (2.2%)	471 (0.9%)	2750 (2.4%)
Hypertension	13100 (29%)	21666 (32.8%)	26145 (26.9%)	42021 (27.1%)	3875 (20.3%)	9595 (31.4%)	8253 (16.6%)	30141 (26.5%)
Hyperlipidemia	5947 (13.2%)	9789 (14.8%)	12364 (12.7%)	21208 (13.7%)	1556 (8.2%)	3829 (11.9%)	3245 (6.5%)	12222 (10.7%)
Number of hospitalizations								
0	26861 (59.5%)	32456 (49.1%)	64649 (66.5%)	100039 (64.6%)	12441 (65.2%)	21104 (69.2%)	36101 (72.7%)	88270 (77.5%)
1-2	9317 (20.6%)	17686 (26.8%)	16798 (17.3%)	31118 (20.1%)	6135 (32.2%)	8707 (28.5%)	12501 (25.2%)	23826 (21.0%)
3-4	4424 (9.8%)	8043 (12.2%)	7578 (7.8%)	12042 (7.8%)	451 (2.4%)	598 (2.0%)	931 (1.9%)	1459 (1.3%)
5+	4575 (10.1%)	7895 (12.0%)	8138 (8.4%)	11646 (7.5%)	56 (0.3%)	102 (0.3%)	155 (0.3%)	262 (0.2%)

*Patient characteristics were observed during a 15 month baseline period, unless otherwise specified.

CV: Cardiovascular, IV: intravenous, PDC: proportion days covered, SD: standard deviation

P1471

BILATERAL OSGOOD - SCHLATTER DISEASE IN A YOUNG SPORTSMAN

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Background: Osgood Schlatter (OSD), referred as osteochondrosis, tibial tubercle apophysitis, or traction apophysitis of the tibial tubercle, is a cause of anterior knee pain in the skeletally immature athletic population.

It is a common condition in active young athletes and is associated with a period of growth spurts. Clinical features include mild to severe, intemittent or continuous pain, tenderness, swelling and a limp. Radiological features include enlarged and fragmented tibial tubercle.

Case description: Here we have a case of a fifteen years old male presenting with pain, tenderness, swelling and a discrete limp while walking. He was referred to us by a primary care physician. His detailed evaluation was carried out and was diagnosed on the basis of history, clinical findings on both knees and plain radiographs, again on both knees as Osgood Schlatter Disease.

Treatment: Treatment for Osgood Schlatter consists of reduced physical activity, decreased or entirely secession from intensive sport activities, analgesia and pyhsical therapy.

Results: Since the symptoms are typically self limiting, the patient was instructed for a gradual return to activity once the pain improved, of course under the supervision of a physiotherapist. The return to full athletic performance was made with changes to the playing style and with inclusion of the team`s coach.

Conclusion: Initial Assessement, detailed investigations and making changes in the level of activities of the athlete helps improvement in Osgood Schlatter disease.

Keywords: Osgood Schlatter disease, young athlete, evaluation, Patellar tendon, Tibial tuberosity

P1472

TREATMENT OF OSTEOPOROSIS IN THE FIELD OF RHEUMATOID ARTHRITIS

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Background. Individuals with RA are at increased risk of developing osteoporosis.

Chronic inflammation associated with RA, medications used to treat the disease, particularly prednisone and other corticosteroid (“steroids”) drugs, all contribute to this risk.

Inadequate intake or absorption of bone-building calcium, and less exercise due to fatigue and pain, may contribute to reduction in bone formation, bone mineral fractures due to osteoporosis than the average population, as well as a 40% increase in hip fractures, as well as loss of height and periodontal bone loss (loss of bone around the teeth in the jaw and skull).

Objectives. This study aims to identify the risk of fractures of osteoporosis in patients with RA with a prolonged treatement with corticosteroids. On the other hand we will evaluate how Osteoporosis has changed under treatment with Alendromat.

Methods. The study included 68 cases presented at the Rheumatology ward, QSUT and Trauma Hospital Tirana,Albania who had been under systematic treatment with AIJS for some time and have developed fractures due to Osteoporosis. Cases has been taken from patient with AR witch have developed fractures due to Osteoporosis.

Results. In the sample taken in the study, it was found 82 % (56) of the patients with AR developed Osteoporosis.It is known that the usage for a prolonged time of AIJS increase the risk of these condition. From this, 89% (61) patients have developed fractures due to Osteoporosis.52% (30) patients have fracture of bachin, 32% (18) patients developed fracture of toracal colon, 28% (16) patients fracture of femur.

After the treatment with bisphosphonate (Alendronat) for more than 3 years it was seen that there was a significant improvement in the reduction of fractures. We have a reduction in the number of cases with fractures over 68% (38) patients of the cases that had developed at least one such before.At the same time in these patientis DEXA showed noticeable improvements.

Conclusions Loss of bone mineral density occurs naturally with the normal aging process. Rheumatoid arthritis and its treatment with corticosteroids can increase an individual’s chance of developing a low bone mineral state such as osteopenia or osteoporosis.

Screening tests to identify poor bone mineralization are important along with treatment with Alendronat. Conservative measures such as diet, supplements, exercises and fall prevention are all important to include in a bone-healthy lifestyle. We have a reduction in the number of cases with fractures over 68% (38) patients of the cases that had developed at least one before.

Key words: *Reumatoid Arthritis, Osteoprosis, AIJS, Fracture, bisphosphonate (Alendromat)*

P1473

CASE REPORT ON THE MANAGEMENT OF OSTEOPOROSIS IN A 24-YEAR-OLD PATIENT WITH CELIAC DISEASE

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Introduction

Osteoporosis is a generalized skeletal desease characterized by low bone density and alterations in bone microarchitecture. There are many barriers to optimal management of osteoporosis in younger adults, further enhanced by a limited research focus on this cohort. Current definitions and recomandations are focused in the evaluation of the desease in young ages.

Presentation of case

A 24 years olf female patient come to our department with hip pain on the left side.She refered that this pain has started since 8 months ago and continued increasing in frequence since nou that a fracture is present. Tha patient refers that suffer from celiac desease.

Objectives. This study aims to identify the risk of fractures of osteoporosis in patients with Celiac desease . On the other hand we will evaluate how Osteoporosis can be treated in young ages.

Materials and methods

The study included a 24 years old female who presented to the rheumatology department, QSUT and Trauma Hospital Tirana,Albania with fragile fracture in pelvis. For this study our patient underwent a series of examinations such as radiography of the fractured bone, BMD of Z- score or T-score. On the other hand based on the primary desease were evaluated the nivel of D vitamin, Calcium, Magnes etc.

Results:

Untreated celiac disease is associated with increased fracture risk by up to 43% and abnormal bone microarchitecture.Malabsorption secondary to celiac disease also causes vitamin D deficiency. Although a gluten-free diet, and vitamin D and calcium supplementation improve bone microarchitecture, complete restoration was not observed.

1. Fragility fracture in the setting of chronic disease/medication exposure.
2. The role of BMD in the diagnosis of osteoporosis in YA with fractures in the absence of clinical risk factors is unclear. Given previously described evidence to support the presence of microarchitectural abnormalities in YAs with fragility fracture and varying aBMD (with average aBMD *Z*-scores >−2.0 at the spine and hip) in the absence of clinical risk factors, consideration of fragility fracture alone as a diagnostic criterion for osteoporosis in young ages is relevant.

Treatment: Vitamin D supplementation; Increased dietary calcium to1000 mg/daily;Smoking cessation; Individualised therapy based on underlying cronic desease (Celiac desease).

Conclusions Osteoporosis is a generalized skeletal desease characterized by low bone density and alterations in bone microarchitecture . Loss of bone mineral density occurs naturally with the primary celiac desease. Screening tests to identify poor bone mineralization are important along the malabsorbing minerals caused by Celiacy. Conservative measures such as diet, supplements, exercises and fall prevention are all important to include in a bone-healthy lifestyle.

Key words: *Celiac desease, Osteoprosis, Fracture, young age, healthy lifestyle, prevention.*

P1474

GENETIC FACTORS ASSOCIATED WITH SARCOPENIA AND FRAILTY IN THE LITHUANIAN ELDERLY

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Objective: to evaluate and identify genetic factors associated with sarcopenia and frailty in the elderly using a large-scale whole genome association analysis.

Material and Methods. A total of 192 Lithuanian older adults (42 men, 150 women, aged 82.2±7.6 years) participated in the study: 57 individuals with sarcopenia and/or frailty (17 men, 40 women, aged 85.3±6.7 years), and 135 healthy controls without sarcopenia or frailty (25 men, 110 women, aged 80.2±7.5 years). Phenotypic data were collected via the questionnaires, scales, and testing of physiological characteristics. Sarcopenia measured according to the "European Working Group on Sarcopenia in Older People", and frailty determined by Fried's criteria. Select phenotypes (lean body mass, walking pace and grip strength) were used for genome-wide association study (GWAS). DNA was isolated from peripheral blood leukocytes. Infinium Global Screening Array24 v3.0 Kit was employed to genotype 700,000 single nucleotide polymorphisms (SNPs) for each participant. Data quality control was performed using *GenomeStudio* software tools. SNPs were included in the analysis, with a genome-wide significance threshold set at <5×10-8 and a suggestive significance threshold set at 1.0×10−5. GWAS was performed using the PLINK v.1.07 tool.

Results: The results of GWAS showed no statistically significant association of SNPs with sarcopenia and frailty status. Two SNPs rs75652203 (regulatory region variant) and rs17102732 (intergenic variant) were found to be statistically significantly associated with grip strength (p values 8.134e-12 and 3.373e-09, respectively; p values after Bonferroni correction 1.416e-06 and 0.000587 respectively). In addition, 4 suggestive SNPs (*ACACA* intronic rs3744589 variant, *RN7SL509P* gene rs850577 upstream variant, intergenic variant rs10043030 and regulatory region variant rs8066532) were associated with grip strength, and 2 suggestive intergenic variants rs60001950 and rs10903128 with walking pace.

Conclusion: We found significant association of two SNPs

(rs75652203, rs17102732) with grip strength in patients with sarcopenia and/or frailty. Additionally, four SNPs showed suggestive association with grip strength, and two SNPs with walking pace. These findings highlight specific genetic loci that may contribute to key functional components of sarcopenia and frailty, warranting further investigation to clarify their biological roles.

This project has received funding from the Research Council of Lithuania (LMTLT), agreement No S-MIP-22-36.

P1475

TELOMERE LENGTH SHORTENING IN ELDERLY WITH SARCOPENIA AND FRAILTY

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Objective: to investigate the properties of leukocyte telomere length in older adults with sarcopenia and frailty.

Material and Methods. 197 elderly participants (43 male and 153 female, average age of 82.2±7.6 years) were included in this study: 121 individuals with sarcopenia and/or frailty (26 male and 95 females, aged 85.3±6.7 years) and 75 healthy socially active older adults (17 male and 58 female, average age of 80.2±7.5 years) without sarcopenia and/or frailty. Phenotypic data were collected via questionnaires, scales, and testing of physiological characteristics. Sarcopenia was measured according to the European Working Group on Sarcopenia in Older People (EWGSOP), and frailty was determined by Fried's criteria. Leucocyte relative telomere length (LrTL) was determined by real-time quantitative polymerase chain reaction on DNA extracted from blood samples (using *PureLink™ Genomic DNA Mini Kit)* and quantified as the telomere/single-copy gene (T/S) ratio. Statistical analysis was performed in R Studio version 4.3.1.

Results. We found that the average LrTL for older adults participating in this study was 0,40±0,26 T/S units. Individuals with sarcopenia and frailty had shorter LrTL (0.30 [95% CI 0.27–0.34]) than the healthy older adults (0.479 [95% CI 0.43–0.53]; p<0.001). Elderly participants with LrTL below the average had higher odds of having sarcopenia and/or frailty compared to those with LrTL above the average (OR = 4.51; 95% CI 2.22–9.18). A significant negative correlation was observed between LrTL and the age of older adults (r = −0.45, p<0.001). No significant differences in LrTL were found between genders.

Conclusions. Shorter telomeres correlate with older age as well as frailty and sarcopenia. Older adults with shorter telomeres have a 4.5 higher odds of sarcopenia and/or frailty. Our findings provide evidence for an additional determinant of sarcopenia and frailty.

This project has received funding from the Research Council of Lithuania (LMTLT), agreement No S-MIP-22-36.

Keywords. Sarcopenia, frailty, telomere length

P1476

FEATURES OF ASSESSING THE RISK OF FRACTURES IN PATIENTS WITH CHRONIC INFLAMMATORY RHEUMATIC DISEASES AND SEVERE METABOLIC DISORDERS

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Osteoporosis (OP) and increased fracture risk are common comorbidities in chronic inflammatory rheumatic diseases. Bone loss and increased bone fragility are characterized by a high prevalence among patients with rheumatoid arthritis (RA) and conflicting data in patients with psoriatic arthritis (PsA). However, OP, along with other comorbidities (cardiorenal disorders, metabolic syndrome, obesity, infections, depression, etc.), can affect both clinical outcomes and management tactics in such patients. Objective: to study the features of osteoporosis-associated fracture risk assessment in patients with RA and PsA with concomitant metabolic disorders.Materials and methods. A total of 46 patients with RA according to the ACR/EULAR criteria (2010) aged 40 to 76 years (mean age 56.7±8.85 years, women – 80.4%) and 43 patients with PsA according to the CASPAR criteria (2006) aged 45 to 75 years (mean age 58.0±8.1 years, women – 67.4%) were examined. The presence of metabolic syndrome (MS) in patients was diagnosed according to the criteria of the National Cholesterol Education Program / Adult Treatment Panel III (NCEP/ATPIII; 2004). The harmonized NCEP/ATPIII criteria included: (1) an increase in waist circumference ≥ 102 cm for men and ≥ 88 cm for women; (2) fasting glucose ≥ 6.1 mmol/L or drug treatment for elevated glucose; (3) triglyceride (TG) ≥ 1.7 mmol/L; (4) high-density lipoprotein (HDL) less than < 1.0 mmol/L in men or < 1.3 mmol in women; (5) BP ≥130/85 mmHg or history of antihypertensive treatment. In accordance with these indicators, all study participants were assigned a binary assessment of MS ("yes/no") and a categorical assessment of MS was calculated for all available criteria (from 0 to 5).

Results and discussion. Signs of MS were detected in 22 patients with RA (47.8%) and 19 patients with PsA (44.2%). Of all the criteria for MS, the most common in both RA and PsA patients was an increase in waist circumference (10 people, 45.5% and 8 people, 42.1%, respectively), which is an important tool in assessing visceral adipose tissue. It is noteworthy that the structure of the categorical assessment of MS in patients with RA and PsA was almost identical (the presence of 3 categorical signs in 54.5% (in 12/ of 22) and 52.6% (in 10/ of 19), 4 signs in 41% (9/22) and 36.9% (7/19) and all 5 signs in 4.5% (1/22) and 10.5% (2/19) of cases, respectively). The prevalence of OP according to the data provided by patients during the initial examination in RA significantly exceeded the indicators of PsA patients (36.6% and 14%, respectively, p<0.001). When interviewing patients, it was found that 95.6% of RA patients had previously (at an outpatient appointment, in a hospital setting) calculated the FRAX index, and in 74% of cases, patients had undergone osteodensitometry. Among PsA patients, such measures were carried out significantly less

frequently (32.6% and 20.9%, respectively). Given the ambiguous data on the state of mineral density and the level of bone metabolism, as well as contradictory data on the frequency and risk of fractures in patients with PsA, we calculated the 10-year probability of fracture in the entire cohort of PsA patients included in the study. When calculating the FRAX index, only clinical risk factors were used, since bone mineral density (BMD) had not previously been studied in a significant number of patients, and some patients were unable to provide the necessary information. When processing the obtained data, a moderate association was found between a high risk of fractures (10-year probability according to FRAX) and the presence of metabolic syndrome in patients with PsA (association coefficient φ = 0.37). When comparing age- and gender-matched groups of PsA patients with MS (group I) and without it (group II), statistically significant differences were observed in the 10-year probability of an overall fracture (9.8 [6.9; 15.0]% compared with 7.4 [6.3; 9.2]%; M-W U test, p = 0.029), but not a hip fracture (0.9 [0.4; 2.1]% compared with 0.6 [0.4; 1.0]%; M-W U test, p = 0.105). The number of PsA patients with a high fracture risk (≥16%, which corresponded to the table intervention threshold for the age of 58 years) statistically significantly prevailed in the group of patients with signs of MS (Chi-square with Yates correction=4.01, p=0.045). Fracture risk assessment using the FRAX tool, even without osteodensitometry data, identified 7 (16.3%) patients with PsA (including 6 people with MS) who deserved anti-osteoporotic treatment. All patients in this group (n=7) underwent DEXA at the Zborovsky Research Institute of Cardiovascular and Radiology. When processing the obtained results, four people had T-criterion indicators that corresponded to osteopenia (from -1 to -2.4 SD), and three people had osteoporosis (< -2.5 SD). Thus, the results of the study show that in patients with PsA, in addition to the previously described predictors of the 10-year probability of fractures (such as age, BMD, disease activity), the presence of MS and the severity of metabolic disorders can also be risk factors. Conclusions. The use of the FRAX index as a tool for assessing the risk of fractures is easily applicable and should be widely used not only in the population of patients with RA, but also in patients with PsA, especially in the presence of severe metabolic disorders, for earlier identification of patients with potentially low BMD and timely drug prevention of fractures associated with osteoporosis.

P1477

ADDITIONAL EXAMINATION OF THE FOREARM IN THE TARGET GROUP OF POSTMENOPAUSAL WOMEN INCREASES THE DETECTION OF OSTEOPOROSIS

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A bone mineral density (BMD) examination of the forearm according to currently approved guidelines is performed when other skeletal areas are inaccessible, when the patient's weight exceeds the limitations of the device, and to obtain data on the cortical bone (in hyperparathyroidism).
In older patients, the loss of BMD in standard areas may be offset by concomitant diseases of the spine, osteoarthritis of the hip joint, and calcification of the abdominal aorta.
It is also known that patients with osteoporosis (OP) have a higher prevalence of spinal deformities than people without OP. The study was performed on a Stratos dR X-ray densitometer in 2024 using the Eurasian normative curve from DMS normality curves, 2003/2004.
A total of 258 BMD studies of female patients (age (M ± σ) 66 ± 0.567) with a scan of the forearm were analyzed.
The norm for 1/3 of the radius (TR1/3) was detected in 61 (23.6%) patients.
Low bone mass (LBM) - in 82 (31.8%), of which 48 (58.5%) had normal spine and 13 (15.9%) had normal proximal femur.
OP - in 115 (44.6%), of which 56 (48.7%) had normal spine and 6 (5.2%) had normal proximal femur.

Table 1. BMD values of the Femoral Neck, Total Hip and Radius in patients with normal lumbar spine density values.

Parameter	N 56 (48,7%)	N 48 (58,5%)	Reliability (p)
Age	70 [63;76]	65,5 [57;70]	0,003
TL1-L4, CO, Me [Q25; Q75]	0,2 [-0,3;+0,7]	0,5 [-0,4;+1,3]	0,26
Femoral Neck	-1,5 [-1,9;-1,2]	-1,3 [-1,7;-0,5]	0,022
Total Hip	-1,1 [-1,6;-0,6]	-0,6 [-1,3;0]	0,019
1/3 Radius	-3,7 [-4,5;-3,0]	-1,6 [-1,9;-1,4]	0,0000

*Differences were considered statistically significant at p<0.05.
The study of the p-ka was not performed in 20 (3.5%) patients due to the presence of metal structures in more than 2 vertebrae of the studied range.
The results of the study show that very low BMD in 1/3 of the radius was detected mainly in patients over 70 years old.
Additional examination of the forearm in postmenopausal women increases the detection of OP with normal and reduced BMD determined by standard zones.

P1478

VITAMIN D LEVELS IN PATIENTS WITH POSTMENOPAUSAL OSTEOPOROSIS: A PILOT STUDY

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Introduction: Determining the level of vitamin D in patients with Postmenopausal Osteoporosis (PMOP) is important for two reasons. First, vitamin D deficiency reduces calcium resorption from the gastrointestinal tract and second, vitamin D deficiency increases the risk of fracture.

Objective: To show the level of vitamin D in patients with PMOP in relation to age.
Material and method: The study included 90 patients who were diagnosed and treated at the University Clinic for Physical Medicine and Rehabilitation. The level of vitamin D was determined by measuring 1.25 (UN) vitamin D in serum by electrochemiluminescence. The value ≥30ng/ml is considered normal, the value between 10 and 30ng/ml for insufficiency and the value ≤10ng/ml for very low.
Results: Patients had a mean age of 60.64 ± 6.7 years. The largest number, or percentage of patients, were aged 60 to 69 years - 53 (57.61%). The mean serum vitamin D level in the age group 40-49 years was 22.47 ± 9.9, 50-59 years 13.61 ± 6.5, 60-69 years 20.37 ± 8.7, 70-75 years 16.31 ± 7.2. Vitamin D levels were non-significantly lowest in the 50-59 year old group compared to the other age groups (13.61 ± 6.5µg) (p=0.16). Serum vitamin D levels were low regardless of age group of PMOP patients.
Conclusion: Mean serum vitamin D levels did not differ significantly between age groups of PMOP patients. Vitamin D should be recommended for all PMOP patients regardless of age group.

Keywords: vitamin D, Postmenopausal Osteoporosis

P1479

ADHERENCE TO OSTEOPOROSIS THERAPY AMONG RURAL WOMEN AGED 50+: THE IMPACT OF PRIOR FRACTURES AND COMORBIDITY

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Objective. This study aimed to assess adherence to anti-osteoporotic therapy among rural women aged 50 years and older and to determine the influence of prior low-energy fractures and comorbidity on treatment adherence.
Materials and Methods. From 2021 to 2022, a health assessment was conducted among all women aged ≥50 years (n=576) registered at a rural healthcare unit (Kalinovo village, Sverdlovsk region). Among these women, 113 (21.2%) had a confirmed diagnosis of OP and were prescribed therapy in accordance with national clinical guidelines. Adherence was evaluated at 12 months (via telephone survey) and again at 18 months (during an in-person follow-up visit). Comorbidity was assessed using the Charlson Comorbidity Index.
Results. Overall adherence to bisphosphonate therapy after one year was 44%. Among patients with a history of fractures, 51.22% adhered to the prescribed regimen, compared to only 8.33% of those without a fracture history (OR=11.55, p=0.00043). The mean age did not differ significantly between groups (68.6±11.3 years in the fracture group vs. 71.7±9.1 years in the non-fracture group; p=0.161). The Charlson Comorbidity Index was significantly higher in the group without a history of fractures (p=0.028), possibly reflecting a greater burden of chronic conditions and polypharmacy.
Conclusions. Adherence to anti-osteoporotic therapy in rural women aged 50 years and older remains low (44%). A previous low-energy fracture is a key predictor of higher adherence (51.22% vs. 8.33%), whereas women without fractures, who typically have a higher comorbidity burden, show poorer adherence. Personalized and comprehensive strategies, taking into account the risks associated with polypharmacy and adverse effects, are crucial to improving treatment outcomes in this patient population.

P1480

THE POTENTIAL OF CORNELIAN CHERRY IN SUPPORTING THE TREATMENT OF BONE-RELATED DISEASES THROUGH MODULATION OF OSTEOBLAST GENE EXPRESSION

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Objective: Cornelian cherry (Cornus mas, CC), known for its antioxidant and anti-inflammatory properties, has been studied for its potential effects on bone health, in conditions such as diabetic bone disease and osteoporosis. Despite promising findings, the mechanisms behind these effects remain unclear. This in vitro study aimed to examine the effects of CC extract on the expression of genes associated with bone structure, metabolism, and development using cultured osteoblasts.
Material and Methods: The extract of CC pulps was prepared via methanol extraction, filtration, and evaporation, then dissolved in cell culture medium and administered to rat primary osteoblasts at concentrations of 0, 10, 100, and 200 µg/ml (C0, C10, C100, and C200, respectively). After 72 hours, mRNA was isolated, cDNA was synthesised and the expression of 15 target genes (RUNX2, BMP2, BMP7, TGFB1, TGFBR1, BGLAP, ALPL, SPP1, VDR, COL1A1, IBSP, CDH11, VEGFA, TNFSF11, TNFRSF11B) was analysed using real-time PCR.
Results: The CC extract upregulated the expression of RUNX2, BMP7, TGFBR1, BGLAP, ALPL, CDH11, and VEGFA genes in all groups. In addition, CC treatment resulted in a dose-dependent increase in the expression of certain genes: TGFB1 in group C10, VDR in groups C10 and C100, BMP2 and IBSP in groups C100 and C200, and TNFRSF11B in group C200. Conversely, significant downregulation was observed for SPP1 in all groups and for TNFSF11 in groups C100 and C200.
Conclusion: These findings suggest that CC extract promotes osteoblast differentiation, bone mineralisation, and osteogenesis while inhibiting bone resorption. The results point to the potential of CC in supporting the treatment of bone-related diseases.
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P1481

OSTEOPOROSIS IN PATIENT WITH MULTIPLE ENDOCRINE NEOPLASIA

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Objective: An important part of diagnostic and treatment of osteoporosis is the exclusion of secondary forms resulting from various pathological conditions and diseases. Multiple endocrine neoplasia type 1 (MEN 1) is an autosomal-dominant disease. Primary hyperparathyroidism (PHPT) is often associated with MEN 1 and often had a recurrent course, despite successful parathyroidectomy. Osteoporosis is considered a complication and an indication for parathyroidectomy.
Case report: 50 years old female had a complain on lumbar bone pain. She was operated earlier for insulinoma and received oral hypoglycemic therapy. The patient had a history of right nephrectomy for urolithiasis. On admittion DXA showed L1-4 T-score=-2,9 SD. During the examination ultrasound showed pathological zone near the left lobe of thyroid gland (parathyroid gland?) Later laboratory investigations confirmed primary hyperparathyroidism: parathormone (PTH) 184 pg/ml (15-65). Subtotal parathyroidectomy was performed. In the postoperative period PTH became normal range 39.5pg/ml (15-65), but 2 years later increase in PTH 82 (15-65) and serum calcium 2.59 mmol/l (2.2-2.55) was revealed again. Creatinine was 108.9 umol/l, GFR 53 ml/min/1.73 m2 HbA1c 6.61%. Scintigraphy was performed and a parathyroid adenoma near the right lobe of thzroid gland was detected. Right parathyroidectomy was performed. All the time the patient was treated with bisphosphonates. DXA showed increase in BMD; L1-4 T-score improved to 0.3 SD, total hip – 0.6, -0.7 SD.
Conclusion: In this case parathyroidectomy improves bone mineral density in patient with primary hyperparathyroidism in the setting of MEN 1.

P1482

THE IMPACT OF DAILY CALCIUM CONSUMPTION ON OSTEOPOROSIS-RELATED FACTORS IN SLOVAK POSTMENOPAUSAL WOMEN

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Objectives: Calcium (Ca) is essential for maintaining bone health, growth, and strength, as well as fracture healing. The International Osteoporosis Foundation (IOF) and the World Health Organization (WHO) have recommended a daily intake of 1,200 mg of calcium for postmenopausal women. However, the observed intake frequently falls short of this recommendation. This study aimed to evaluate daily Ca intake in a sample of 352 Slovak postmenopausal women and analyse the relationship between dietary Ca intake and variations in femoral (FBMD) and lumbar spine bone mineral density (LBMD), alkaline phosphatase (ALP), osteocalcin (OC), and beta-CrossLaps (CTx).
Material and Methods: Dietary Ca intake was assessed using a validated questionnaire. The women were divided into three groups based on their daily Ca intake: A (≤250 mg; N=87), B (250-750 mg; N=198), and C (>750 mg, N=67). The association between Ca intake and BMD, as well as markers of bone turnover, was analysed using analysis of covariance.
Results: The average daily calcium intake among Slovak postmenopausal women was determined to be 485 mg/day, with no individual reporting an intake exceeding 1,000 mg. Furthermore, our study revealed no significant associations between calcium intake groups and osteoporosis-related parameters (FBMD, LBMD, ALP, OC, CTx). These findings suggest that changes in calcium intake among women consuming less than 1,000 mg daily do not significantly affect their risk of developing osteoporosis.
Conclusion: While studies suggest that increasing calcium intake from dietary sources or supplements can modestly boost bone density, this effect is often temporary. Ensuring adequate calcium, vitamin D, and a balanced diet is crucial for maintaining overall bone health
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P1483

AGE-RELATED FEATURES IN THE TREATMENT OF SUBACROMIAL IMPINGEMENT SYNDROME

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Periarticular administration of platelet-rich blood plasma (PRP) and hyaluronic acid (HA) is widely used in acute joint injuries. However, the effectiveness of these drugs in patients of different ages has not been sufficiently studied.
Objective: To evaluate the effectiveness of PRP and HA in patients with subacromial impingement syndrome, depending on age and individual characteristics. Materials and methods: The study involved 100 patients, 54% of them men and 46% women, with an average age of 51.5±15.1 years, with a duration of subacromial impingement syndrome of more than 3 months. Patients under 45 years of age accounted for 34%, over 45 years of age – 66%. After the examination, all patients were randomized into 2 groups. Group 1 received 3 subacromial injections of PRP with an interval of 7 days each, Group 2 received 2 subacromial injections of HA with an interval of 7 days each. Pain dynamics were assessed using a 100-millimeter visual analog scale (VAS), functional disorders according to the American Shoulder and Elbow Joint Surgeons Assessment Scale and the CSS (Constant Shoulder Score) scale, as well as a decrease in the need for nonsteroidal anti-inflammatory drugs (NSAIDs) 6 months after the course of therapy.
Results: The dynamics of pain and function in the treatment of PRP and HA did not differ. Pain decreased from 56.0±14.6 to

31.8±26.3 and from 57.6±17.8 to 30.2±26.3 (p=0.768), AS increased from 54.8±13.8 to 74.6±22.4 and from 54.7±15.1 to 77.3±22.5 (p=0.552), CS from 59.2±14.4 to 66.9±17.4 and from 47.8±16.9 to 65.6±19.3 (p=0.245). However, in the treatment of PRP and HA, the dynamics of pain and function were significantly better in patients younger than 45 years than in patients older than 45 years. The VAS pain level after 6 months was 22.4±26.3 and 35.5±26.2 (p=0.022), ACC 83.3±20.9 and 72.1±22.6 (p=0.017), CS 76.2±16.1 and 63.2±18.2 (p=0.001). During follow-up, 82.4% and 65.2% of patients (p=0.103) did not need to take NSAIDs. No serious adverse reactions were observed. The following factors did not affect the treatment: the initial pain level, the number of affected tendons, gender, body mass index (BMI).
Conclusions: The effectiveness of PRP and HA in subacromial impingement syndrome does not differ. The clinical response to both drugs was higher in those under 45 years of age.

P1484

THE ROLE OF ORTHOTICS IN OSTEOARTHRITIS AND VARUS DEFORMITY OF THE KNEE JOINT

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Orthosis is one of the widely used methods of conservative treatment of osteoarthritis (OA) of the knee joint (CS). However, there is relatively little data in the literature on the use of functional, unloading (varus-valgus) orthoses.
The purpose of the study: to evaluate the effectiveness and safety of using a functional, unloading (varus-valgus) orthosis in patients with OA 3st and varus deformity of the knee joint.
Material and methods: The study involved 15 patients with OA 3st and varus deformity of the CS, confirmed by X-ray examination under stress (30.0% of men and 70.0% of women, average age 64.5±8.9 years, BMI 30±3.4). The inclusion criteria were: Osteoarthritis of the knee joint stage III according to Kellgren-Lawrence, established according to clinical and X-ray examination, age from 45 to 85 years, pain range ≥40mm. All patients used a functional, unloading (varus-valgus) orthosis for 3 months. The orthosis was adjusted four times every 7 days for 4 weeks.
Result: When using an orthosis, 12 patients noted a significant decrease in pain intensity, but the dynamics of functional parameters was minimal. The average pain and function indicators among all patients participating in the study were: VAS initially 49.0±11.3, in the first hour of use 27.0±13.9, after 1 month. 18.0±9.7, after 3 months. 15.0±8.5. KOOS initially, after 1 and 3 months 48±10.3, 56.7±10.6, 60.0±10.6. No adverse reactions were observed against the background of the use of a functional, unloading (varus-valgus) orthosis.
Conclusions: The relief (varus-valgus) orthosis significantly reduces the intensity of pain starting from the first hours of its use and maintains positive dynamics throughout the wearing of the orthosis, however, it does not significantly affect the function of the joint.

P1485

THE VALUE OF HIGH MOLECULAR WEIGHT HYALURONIC ACID IN POST-TRAUMATIC OSTEOARTHRITIS OF THE KNEE JOINT

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The incidence of osteoarthritis (OA) of the knee joint (CS) in the world is constantly growing, this is due to many factors, including joint injuries. Intra-articular injections of high-molecular hyaluronic acid are one of the means of helping patients with stage 3 OA. However, there is little data in the literature on the effectiveness of high molecular weight hyaluronic acid with chondroitin sulfate, depending on the frequency of administration.
The purpose of the study: to evaluate the effectiveness of single or double administration of high molecular hyaluronic acid with chondroitin sulfate in post-traumatic osteoarthritis of the knee joint
Materials and methods: The treatment of 61 patients with stage 3 post-traumatic osteoarthritis of the knee joint was evaluated. All patients underwent intra-articular administration of high molecular weight hyaluronic acid with chondroitin sulfate, 36 patients received a single injection and 25 received a double injection with an interval of 7 days. To evaluate the results, the pain intensity was determined on a visual analog scale (VAS) and the total score on a numerical rating scale (NRS) before the start of treatment, after 1, 3, 6 and 12 months. after a course of intra-articular injections of hyaluronic acid by telephone survey.
Results: In all patients, pain at rest at baseline, after 2 weeks, 1, 3, 6, 12 months was 2,7±3,1, 1,5±2,6, 1,8±2,6, 2,1±2,6, 2,2±1,8, 2,6±1,3 cm (VAS). Pain when moving 6,7±3,1, 4,0±3,2, 4,3±3,1, 4,6±2,8, 4,5±2,5, 5,3±1,4 cm VAS. The function indicators at baseline, after 2 weeks, 1, 3, 6, 12 months were 4,9±3,6, 3,5±2,9, 4,2±2,9, 4,0±3,2, 3,5±2,7, 4,3±1,9 according to the NRS. In the first group, there are similar indicators: pain at rest 2,7±3,1, 1,5±2,6, 1,8±2,6, 2,1±2,6, 2,2±1,8, 2,6±1,3 cm VAS. Pain when moving 6,7±3,1, 4,0±3,2, 4,3±3,1, 4,6±2,8, 4,5±2,5, 5,3±1,4 cm VAS. Function 4,9±3,6, 3,5±2,9, 4,0±2,9, 4,0±3,2, 3,5±2,7, 4,3±1,9 according to the NRS. In the second group, pain at rest initially, after 2 weeks, 1, 3, 6, 12 months 2,6±2,4, 1,9±1,7, 1,8±1,6, 1,8±1,7, 1,5±2,2, 0,6±1,0 cm VAS. Pain when moving 5,6±2,1, 3,3±1,7, 3,6±1,8, 3,4±1,6, 3,7±2,4,3,0±1,2 cm VAS. Function 4,0±3,1, 3,3±2,6, 3,6±2,7, 3,4±2,6, 3,3±3,1, 2,6±1,7 according to the NRS.
Conclusions: Double administration of high molecular weight hyaluronic acid with chondroitin sulfate with an interval of 7 days has a higher effectiveness in reducing pain and increasing function.

P1486

WHAT IS THE EFFECTIVENESS OF LOW MOLECULAR WEIGHT HYALURONIC ACID IN PERIARTICULAR DISEASES OF VARIOUS LOCALIZATION?

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Pathologies of the periarticular tissues, which include tendinitis, enthesitis, tendovaginitis, bursitis, fasciitis, are a common cause of musculoskeletal pain. Treatment is based on the combined use of nonsteroidal anti-inflammatory drugs, physiotherapy, rehabilitation, and local injection therapy, including the administration of hyaluronic acid (HA). However, there is relatively little data on the evaluation of the effectiveness of HA in these pathologies.

The purpose of the study: to evaluate the efficacy and safety of HA 500-730 kDa in patients with various lesions of periarticular tissues.

Materials and methods: The study involved 30 patients with various lesions of the periarticular tissues (subacromial impingement syndrome (SIS), lateral/medial epicondylitis, plantar fasciitis), 10 people with each pathology. Of these, 60.0% were women and 40.0% were men, with an average age of 56.1±14.9 years. All patients underwent a course of periarticular injections using low molecular weight Ha 500-730 kDa into the pericondinal region. All patients received 3 injections of HA with an interval of 7 days. The inclusion criteria were: Age over 18 years, significant periarticular pathology of SIS, lateral/medial epicondylitis, plantar fasciitis, moderate or severe pain above 40 mm on a visually analog pain scale (VAS), insufficient effect from the use of glucocorticoids. The result of therapy was assessed after 1 and 3 months according to the outpatient examination. The study was approved by the local ethics committee.

Results: During treatment, the pain and function indicators were as follows: at baseline, after 1 and 3 months. 57,5±15,8, 37,5±13,8, 33,7± 14,0, VAS initial, after 1 and 3 months. 54,2±13,7, 64,5±10,3, 65,5±9,8. With lateral epicondylitis, VAS baseline is after 1 and 3 months. 54,0 ±13,4, 35,0±9,7, 34,0± 11,0, The Mayo Elbow questionnaire is initial, after 1 and 3 months 72.0 ±11.5, 79.2±9.0, 82.7± 7.7. With plantar fasciitis, VAS baseline is after 1 and 3 months 60,0 ±16,5, 36,6±19,3, 34,4± 15,8. Functional index of the foot initially, after 1 and 3 months Compiled 47,2%±22,8, 39,6%±29,7, 39,0%±29,9. No adverse reactions were observed during the study.

Conclusions: Subcutaneous administration of low molecular weight HA is an effective and safe method of treating periarticular pathology of various localization.

P1487

AROMATASE INHIBITORS, BONE LOSS, AND INTRAVENOUS BISPHOSPHONATE TREATMENT: A COMPREHENSIVE GUIDE

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Introduction: Aromatase inhibitors are essential in the treatment of hormone receptor-positive breast cancer patients. In addition to their cancer risk-reducing benefits, they also have some adverse drug reactions, such as accelerating bone loss. One promising approach for therapeutic intervention is the use of intravenous bisphosphonates. Estrogen plays a crucial role in maintaining bone density, and aromatase inhibitors such as anastrozole, letrozole, and exemestane effectively lower estrogen levels and slow the progression of HER2-positive breast cancer patients. The benefits of parenteral administration are undeniable for bisphosphonates, due to their higher bioavailability, lack of gastrointestinal side effects, and lack of Barrett's esophagus, better adherence, and treatment monitoring.

Materials and methods: Patients diagnosed with osteoporosis aged over 45, visited in Rheumatology outpatient . Comparative analysis between three groups of patients:

1st group - 22 postmenopausal women HER2-positive with breast cancer, treated with Zoledronic acid - 5 mg. intravenously every 12 months for 3 years

2nd group - 20 postmenopausal women HER2-positive with breast cancer, treated with Denosumab 60mg subcutaneously every 6 months for 3 years.

3rd group of patients 1st group - 20 postmenopausal women, treated with Zoledronic acid 5 mg. intravenously every 12 months for 3 years

The age of the patients is between 45 and 75 years in all three groups.

The first two groups of patients are treated together with aromatase inhibitors.

The parameters analyzed in all three groups are: BMD and tumor markers.

Results: Tumor markers did not become positive in both groups of patients with breast cancer throughout the entire follow-up period. In the first group - treated with bisphosphonates - at 12 months

the improvement in BMD was (+4.5%), in the second group-+ 4.7%, and in the third with + 4.3%. The results at 24 months were respectively - an improvement in BMD of + 7.2% in the first group, + 6.9% in the second and + 10.2% in the third, and the results at 36 months were as follows: an improvement of 10.3% in the first group, 10.2% in the second and 11.3% in the third (p< 0.001).
Conclusions: The better results in the control group of patients not taking aromatase inhibitors were discussed as a result of the lack of effect of aromatase inhibitor treatment, which affects not only BMD, but also the therapeutic effects of the treatment. There was no significant difference between the two groups of patients - those on intravenous bisphosphonates and those on subcutaneous denosumab. The benefits of intravenous administration of bisphosphonates are: higher bioavailability and the absence of gastrointestinal side effects.
Limitations - a small group of patients.
Keywords: bone mineral density (BMD), human epidermal growth factor receptor 2(HER2) -positive

P1488

CHARCOT ARTHROPATHY - A CHALLENGE IN OUR DAILY PRACTICE

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Aim: The International Working Group on the Diabetic Foot (IWGDF) has published evidence-based guidelines on the prevention and management of diabetic foot disease since 1999. This is the first guideline on the diagnosis and treatment of active Charcot neuro-osteoarthropathy. This serious complication in patients with diabetes mellitus manifests itself with a joint syndrome, mainly involving the feet, therefore early diagnosis is of utmost importance in order to avoid disability and amputation of limbs. The most important recommendation in the presence of soft tissue changes with edema and redness of the overlying skin is to perform comparative thermometry and temperature analysis with an infrared thermometer, imaging diagnostics - X-ray screening, and if necessary, MRI, CT and scintigraphic examination in case of negative X-ray results.
Methods: A retrospective analysis of 82 patients with diabetes mellitus (of which 52 women/n=52/ and 30 men/n=30/, aged 48-69 years) has been made. The duration of the diabetic condition with these patients is between 10 and 25 years. 12 patients have been diagnosed with Charcot arthropathy, which occurs after an average of 20 + / -5 years and is linked to poor metabolic control. 8 of the patients are in the acute stage, and the rest are in the chronic stage, with the late manifestation of the arthropathy being striking.
Results: The change in skin temperature was recorded in all 12 patients, in which Charcot arthropathy was diagnosed, while X-ray changes were detected in 8 patients during the screening examination, and MRI was required in the remaining 4. All patients diagnosed with Charcot arthropathy had poor metabolic control and diabetes duration of more than 15 years.
Conclusions: Charcot arthropathy is a serious medical problem, leading to disability and amputation in late diagnosis. That is why its early recognition is essential for prevention of late consequences
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P1489

PREGNANCY AND LACTATION-ASSOCIATED OSTEOPOROSIS WITH MULTIPLE VERTEBRAL FRACTURES TREATED WITH TERIPARATIDE

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Introduction: Low-trauma fractures in premenopausal women, indicative of osteoporosis, are often driven by secondary causes that require targeted treatment. Pregnancy and lactation-associated osteoporosis (PLO) is a rare condition with an unclear etiology frequently unrelated to known secondary factors. The growing recognition of monogenetic causes highlights the importance of genetic evaluation. PLO imposes severe pain and disability, significantly impairing quality of life during vulnerable periods and complicating future family planning.
Case report: A 32-year-old primipara developed lower back pain without trauma one month before a cesarean delivery. Four days postpartum, she experienced worsening back pain and difficulty walking. A spine X-ray revealed vertebral compression fractures at T11-L3. Bone mineral density (BMD) at L4 (the unaffected lumbar vertebra) showed a Z-score of -4.3; the femoral neck and total hip Z-scores were -1.9 and -1.7, respectively. Her menarche was at 13 years old, and her cycles were regular. Her medical history included only a metatarsal stress fracture at age 25. During adolescence, she had a low body mass index but attained normal weight afterward. There was no history of smoking, alcohol use, oral contraception, or heparin use, and no family history of fragility fractures. She was managed with a thoracolumbar orthosis, vitamin D supplementation, and orthopedic monitoring. Two years later, persistent pain and gait disturbance due to post-traumatic

spinal deformity necessitated elective surgery. Endocrinological reevaluation, including anti-transglutaminase antibodies and homocysteine levels, found no secondary causes again. The patient desired another pregnancy but was fearful of new painful fractures. Two months postoperatively, teriparatide was introduced. Shortly after, she was free of back pain. Teriparatide was continued for two years, during which no new fractures occurred. The patient now plans another pregnancy.
Conclusion: The fracture risk in future pregnancies is significantly elevated in PLO. Evidence suggests that osteoanabolic therapy improves BMD and bone microarchitecture, potentially reducing fracture risk. Furthermore, BMD gains appear to be maintained to some extent, even without subsequent antiresorptive therapy. Teriparatide also seems to be a safer choice for women of childbearing age, avoiding the teratogenic risk associated with antiresorptive treatments. Despite addressing the secondary cause of osteoporosis, skeletal fragility may persist. While PLO is a rare condition, the use of teriparatide for skeletal enhancement may serve as a therapeutic model for treating osteoporotic fractures caused by other secondary factors in women planning pregnancy.

P1490

ASSOCIATIONS BETWEEN SERUM VITAMIN D AND CORTISOL IN PATIENTS WITH TYPE 2 DIABETES MELLITUS DURING ARMED CONFLICT

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Assessment of the role of vitamin D and stress hormones under the influence of a long-term psychotraumatic factor provides information necessary for the prevention of type 2 diabetes mellitus (T2DM) complications. **The aim of the study** was to evaluate the dynamics of vitamin D status and the stress hormone cortisol in patients with T2DM during the full-scale war in Ukraine compared to the pre-war state.
Materials and methods. In 2021–2024, a prospective study was conducted, which included patients with T2DM and a glycated hemoglobin (HbA1c) level ≥ 7 %, individuals with insulin resistance without DM and people without DM aged 19–75 years.
Results. Patients with T2DM have a lower mean level of vitamin D and it decreases during the war, being significantly lower in 2023 and 2024 compared to 2021. When determining the dynamics of serum cortisol in patients without DM in 2024, the following is observed. It was significantly higher than before the war, and in patients with T2DM, it was highest in 2022 with a gradual downward trend in 2023 and a return to an increase of the average level in 2024. When determining the dynamics of serum cortisol, we observe an increase in the average level during the war in patients without DM, and an increase in the average level during the war with a peak in 2023 in patients with insulin resistance without DM. In patients with T2DM, there is an increase in cortisol during the war, which was also present before it began. The lowest level was observed in this group of patients in 2022.
Conclusions. Patients with T2DM during the war compared to the pre-war period had a stably increased level of salivary cortisol. In people without T2DM, there is a significant increase in the average level of serum cortisol during the war compared to the pre-war period. It is recommended to reduce the level of insulin resistance through lifestyle modification, maintaining an adequate level of vitamin D.

P1491

PRIMARY AND SECONDARY FIBROMYALGIA IN BULGARIA

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Background:
Fibromyalgia (FM) is characterized by a chronic widespread pain, general fatigue, anxiety, depression, sleep disturbances and functional disorders. FM affects both women and men in 9:1 to 20:1 ratio
Objectives:
The purpose of this clinical study is to analise clinical manifestations in patients with primary and secondary fibromyalgia. Methods. Eighty-three patients with primary FM, 39 patients with FM and osteoarthritis (OA), 23 patients with FM and systemic lupus erythematosus (SLE), 27 patients with SLE and 36 healthy subjects were included
Material and Methods:
The present study compared chronic pain, fatigue, depression and anxiety in patients with primary FM, patients with SLE, FM+OA, FM+SLE and healthy subjects. 1. Evaluation of the diagnosis of fibromyalgia according to the 2011/2016 ACR criteria. 2. Assessment of fatigue on the physical, cognitive and psychosocial subscales of MFIS. 3. Assessment of anxiety and depression on the HADS scale for anxiety. 4. Assessment of the number of the fibromyalgia tender points
Results:
1. Assessment of the number of chronic widespread pain areas in the three FM groups, healthy individuals and SLE results. The most chronic widespread pain areas were reported in patients with FM+OA 14.05±2.75; followed by the FM + SLE group 13.96±1.8. Patients with primary FM had a mean number of chronic widespread pain areas of 13.8±2.1. Healthy individuals had 7.47±3.57. In SLE patients the chronic widespread pain areas were 4.56±1.63. Based on 2011/2016 criteria for number of chronic widespread pain areas, there is a statistically significant difference of $p < 0.05$ in the mean values of the control group, compared to the number of chronic widespread pain areas in all FM groups of patients. 2. Assessment of the number of tender points results in the three groups of patients with FM, healthy individuals and people with SLE. The average number of tender points is an important parameter for diagnosis. It can be used in practice for comparison of the patients, monitoring the treatment effect and for choosing the most adequate treatment for FM. 3. Assessment of MFIS fatigue results. A statistically significant difference of $p<0.05$ for the MFIS clinical parameter chronic fatigue

was found in the mean values of the control group, compared to the values of all FM groups. 4. Assessment of HADS anxiety results. A statistically significant difference of p<0.05 for the HADS clinical parameter anxiety was found in the mean values of the healthy individuals group, compared to the values of all FM groups, in the mean values in patients with SLE.
5. Assessment of HADS depression results. The HADS depression score in patients with FM+OA was 8.92±4.46, followed by the results of 8.71±4.17 in the FM group. A statistically significant difference of p<0.05 for the HADS clinical parameter depression was found in the mean values of the healthy individuals group, compared to the values of all FM groups of patients; in the mean values in patients with SLE, compared to the values of all FM groups and the group of patients with FM+OA
Conclusion:
1. Patients with primary FM, osteoarthritis and FM, SLE and depression. 2. Patients with SLE without fibromyalgia have fewer areas with chronic widespread pain and a lower degree of depression, anxiety and fatigue, comparable to these symptoms in patients with SLE + FM and healthy individuals. 3. Patients with SLE and FM have additional symptoms of moderate pain, depression, anxiety and fatigue that are not related to SLE and require treatment for FM, regardless of their current SLE treatment
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P1492

ROLE OF EPSTEIN-BARR VIRUS IN PATIENTS WITH PRIMARY FIBROMYALGIA IN BULGARIA

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Fibromyalgia (FM) is characterized by a chronic widespread pain, general fatigue, anxiety, depression, sleep disturbances and functional disorders. The cause of fibromyalgia is unknown. The hypotheses for etiology include genetic predisposition, immune dysfunction, infectious agents, metabolic disturbances, brain dysfunction, toxins, stress, trauma, circulatory abnormalities or a combination of any of these factors. This theory for "central sensitization" proposes that fibromyalgia patients have a lower threshold for pain because of increased reactivity of pain-sensitive neurons in the spinal cord or brain. Some researchers supposed that different neurotransmitters (serotonin, catecholamine) could be involved in the pathophysiology of fibromyalgia-associated symptoms. The connection of FM to different viral infections has been proposed. Epstein Barr Virus (EBV) has been considered a possible cause of FM because of similarity of symptoms, but so far, the connection has not been proven. **Objective.** The objective of this study was to determine the prevalence of antibodies (Abs) IgM and IgG against EBV, and respectively the presence of a viral infection in a group of patients with FM. **Patients and methods.** Forty-one patients (women, men) with fibromyalgia were included in the investigation. Sera and plasmas were collected from all patients. Sera were tested by enzyme linked immunosorbent assay for antibodies (Abs) IgM and IgG against Epstein Barr-virus (EBV)**.** The neurotransmitters serotonin, adrenaline and noradrenaline were tested in the plasma. We also analysed the association between the titter of the antiviral antibodies, some neurotransmitters (serotonin, noradrenaline and adrenaline) and different clinical symptoms. **Results.** When we tested the plasma serotonin concentrations in the patients, we determined levels below 50 ng/l in 35 % of the patients, 52.4% of patients were with low plasma serotonin levels (less than normal range). The remaining patients (47,6%) were with normal plasma serotonin levels. The obtained results revealed that high EBV IgG concentrations in the serum of patients with FM correlated with pain intensity and associated clinical symptoms. When we analysed the association between the fatigue and antiviral IgG Abs, it was found a negative correlation or higher serum levels of IgG Abs against EBV were observed in patients with severe fatigue (r = -0.14), as the associations wasn't statistically significant (p = 0.55). We determined similar correlations between the IgG Abs and other clinical features. The association between the headache and adrenaline (r = -0.27) and noradrenaline (r = -0.58) plasma concentrations in the patients was negative. The stronger headache in patients was associated with lower concentrations of noradrenaline and adrenaline. The dependence between headaches and the concentration of noradrenaline was statistically significant (p = 0.0068). **Conclusions.** Some neurotransmitter can be used as potential markers for evaluation the effects of the applied therapy. The investigation of the levels of neurotransmitters and analyse associations with different clinical symptoms can be useful for daily rheumatology practice. Positive antibodies against some viruses in patients with fibromyalgia suggest the role of some viruses in the pathogenesis; through induce of different immune mechanisms.
This is consistent with the fact that FM is connected to the immune response to certain infectious agents (e.g. EBV, CMV).

P1493

SAFETY AND EFFICACY OF ANTIRESORPTIVE TREATMENTS IN PATIENTS WITH OBESITY: A REGISTRY-BASED STUDY

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Background: Despite the classic concept of obesity as a protec-

tive factor for fractures, recent evidence has shown that these patients are at increased risk of fractures. Obesity has been linked to compromised bone quality, and impaired bone healing, despite normal or even elevated bone mineral density (BMD) in some cases. Anti-resorptive treatments, including bisphosphonates and denosumab, have been the cornerstone of osteoporosis management, however, their efficacy on fracture prevention and mortality in patients with obesity remains less established.

Aim: Evaluate the relationship between anti-resorptive therapy, fracture risk reduction and mortality in a population of patients with obesity.

Methods and subjects: The study population was identified by electronic records of an osteoporosis registry of a large healthcare organization in Israel. Demographics, Comorbidity Index (CCI), bone mineral density (BMD) T-scores, purchase of anti-resorptive agents were collected. Exposure groups were matched using propensity score. Kaplan-Meier curves were generated to assess the time to outcomes. Multivariable Cox's proportional hazards survival model was performed.

Results: Between January 1998 and December 2021 a total of 11604 patients with osteoporosis and a BMI above 30 were identified. The mean BMI was 34.6 (4.2), 37% had a BMI over 35. The mean age was 71.4 (8.3), 75.2% were women. The mean FN T-Score -1.6 (1.0), the mean eGFR was 67.9 (23.1), the mean CCI was 3.6 (2.6). A total of 5412 (46.6%) patients purchased an anti-resorptive agent: 3370 (62.2%) alendronate, 1562 (28.9%) risedronate, 270 (5%) zoledronic acid, and 210 (3.9%) denosumab. Compared to non-treated patients, before matching, the treated patients were slightly older (71.8 vs 70.8, p<0.01), had a lower FN T-Score (-1.7 vs -1.3, P<0.01), and a lower eGFR (65.2 vs 69.5, p<0.01). The proportion of women was higher (83% vs 68.7%) and falls were more frequent (24.2% vs 20.7%) in treated versus non-treated subjects. After matching, 607 pairs of subjects treated and non-treated remained. A total of 489 fractures were reported, 414 at the osteoporosis registry entry. The 5-year cumulative incidence of fracture and death events were 34.5% vs 50.4% and 13.6% vs 21.3% in the treated versus non-treated patients. The risk of fracture and death were HR=0.67 (0.55-0.81) and HR= 065 (0.48-0.88) respectively.

Conclusions: Our findings suggest that anti-resorptive agents reduce osteoporotic fractures and mortality among obese patients, offering valuable insights for treatment strategies in this vulnerable population.

P1494

CORRELATION OF LIPIDS LEVEL AND OSTEOPOROSIS IN RHEUMATOID ARTHRITIS

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Objectives

Rheumatoid Arthritis (RA) is recognized as a contributory factor for osteoporosis (OP) development and also it is acknowledged as a risk factor for cardiovascular disease. Although patients with RA commonly exhibit abnormal lipid metabolism, the underlying mechanisms remain elusive. To date, few studies have focused into the interrelation between lipids, RA, and OP. The aim of this study is to investigate the relationship between lipid levels and OP risk in RA patients.

Methods

It is a retrospective study which enrolled 100 patients with RA, all have been hospitalized at Rheumatology Service of UHC from January 2023-January 2024. Their diagnosis was established according to ACR/EULAR 2010 criteria. Reason for hospitalization vary from diagnosis determination, disease flare ups, current therapy failure ect. Disease activity was evaluated with Clinical Disease Activity Index (CDAI). For each patient was made a correlation of disease activity and lipid panel. DEXA scan was performed in all patients.

Results

Out of 100 patients, 84 were female (84%) and 16 male (16%). Mean age of patients was 39±11 y.o. In total 58 patients (58%) resulted with lipid panel abnormalities, 43 patients resulted with lower levels of HDL (43 %). It resulted a significant statistical association between high disease activity and higher total cholesterol. (p-value < 0.01). Also a significant correlation between disease activity and lower HDL level was observed (p-value < 0.01). From 100 patients,67 patients resulted with T-score below -2.5(defined as osteoporosis).35 out of 67 patients have been in treatment for osteoporosis before this hospitalisation.51 out of 67 patients belongs to the group of 58 patients with lipid panel abnormalities.

Conclusions

This study shows clearly an association of disease activity and lipid panel changes in RA patients.Also it is notable that lipid levels may be indicators of OP occurrence in RA patients.

P1495

EFFICACY OF COMBINED UNDENATURED TYPE II COLLAGEN AND HYDROLYSED COLLAGEN SUPPLEMENTATION IN KNEE OSTEOARTHRITIS: A RANDOMISED CONTROLLED TRIAL

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Background: Collagen supplements have gained significant market popularity, with numerous products claiming to improve knee osteoarthritis symptoms. Previous clinical studies have primarily evaluated individual collagen formulations, with most being industry-sponsored, which raises potential bias concerns. This study aimed to evaluate the efficacy of combined undenatured type II collagen (UC-II) and hydrolysed collagen supplementation in patients with knee osteoarthritis.

Methods: In this randomised, double-blind, placebo-controlled trial, 68 patients with knee osteoarthritis were divided into two groups: one receiving collagen supplements (tablets containing hydrolysed collagen and UC-II) and the other receiving a placebo. Clinical outcomes, including pain intensity (Verbal Numerical Rat-

ing Scale), functional outcomes (Knee Injury and Osteoarthritis Outcome Score [KOOS]), rescue medication consumption, and patient satisfaction, were assessed at baseline, 2, 6, and 12 weeks. Results: Baseline demographic characteristics were comparable between the collagen and placebo groups. Both groups showed significant improvements in pain intensity ($p<0.001$) and KOOS scores over time. However, no significant differences were observed between the groups in terms of pain intensity, functional outcomes, rescue medication consumption, or patient satisfaction ($p>0.05$). No adverse effects were reported in either group. Conclusion: Combined UC-II and hydrolysed collagen supplementation over 12 weeks did not demonstrate superior efficacy compared with that of the placebo in managing knee osteoarthritis symptoms. Further research is required to explore the potential long-term benefits of combined collagen supplementation.

P1496

COMPARISON OF OUTCOMES FOLLOWING BIPOLAR HEMIARTHROPLASTY FOR DISPLACED FEMORAL NECK FRACTURES VERSUS UNSTABLE INTERTROCHANTERIC FRACTURES: A RETROSPECTIVE PROPENSITY-MATCHED STUDY

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Objective: Bipolar hemiarthroplasty (BHA) is a well-established treatment for displaced femoral neck fractures, but its use for unstable intertrochanteric fractures remains less common. This study aims to compare the outcomes of BHA in these two distinct fracture types, focusing on operative parameters, complications, and recovery profiles.
Material and Methods: We conducted a retrospective analysis of 40 patients with unstable intertrochanteric fractures and 319 patients with displaced femoral neck fractures who underwent BHA at our institution. Propensity score matching was applied to account for baseline differences, resulting in 38 intertrochanteric fracture patients matched to 152 femoral neck fracture patients. The primary outcomes evaluated included operation time, blood loss, transfusion requirements, hospital length of stay, and postoperative complications.
Results: Patients in the intertrochanteric fracture group had significantly longer operation times, higher intraoperative blood loss, and greater transfusion requirements compared to those in the femoral neck fracture group. Additionally, the intertrochanteric group had longer hospital stays and a significantly higher incidence of medical complications, particularly cardiovascular events (13.2% vs. 1.3%, $p=0.007$). Surgical complications, including dislocation and infection, were comparable between the two groups.
Conclusions: Although BHA for unstable intertrochanteric fractures is associated with longer operation times and a higher risk of medical complications, particularly cardiovascular events, the incidence of surgical complications such as dislocation and infection is similar to that seen in femoral neck fractures.

P1497

PRIMARY HYPERPARATHYROIDISM: THE INFLUENCE OF VISCERAL ADIPOSE TISSUE ON BONE QUALITY

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Obesity, namely visceral adiposity (VAT) associated with insulin resistance is responsible for other metabolic comorbidities including bone fractures. However, the influence of adipose tissue on bone metabolism has been scarcely evaluated in patients with primary hyperparathyroidism (PHPT). Objectives: To investigate the effect of adipose tissue (e.g. VAT and total fat mass FM) on trabecular bone score (TBS) and bone mineral density (BMD) in subjects with PHPT at baseline and through 12 months after parathyroidectomy (PTX). Moreover, relationships between body composition and calcium-phosphate, lipid and bone metabolism (e.g. plasma osteocalcin) were evaluated. Methods: 112 subjects with PHPT were included in cross-sectional study and subset of 40 postmenopausal women was followed prospectively. Dual X-ray absorptiometry (DXA) was compared with magnetic resonance imaging (MRI) for estimating VAT in prospective study. The results showed that VAT measurement by DXA is well-correlated with MRI in subjects with PHPT. TBS was positively associated with BMD ($p<0.001$) and negatively associated with VAT and FM/height^2 ($p < 0.001$). Plasma osteocalcin levels negatively associated with VAT and FM /height^2 ($p<0.01$). There was a significant increase in BMD (both in lumbar spine and hip) and serum 25(OH) vitamin D after PTX ($P < 0.001$). Although our results demonstrated a mild increase in FM/height^2 and VAT after PTX no significant change in TBS was observed. Our results suggest that the increment of VAT in PHPT may contribute to bone deterioration, as suggested by lower TBS and lower plasma osteocalcin. However, further studies are needed to investigate the underlying mechanisms.
This study was supported by the project GIP -23-SL-07-203 (General University Hospital in Prague) and MH CZ—DRO (General University Hospital in Prague—00064165)
Keywords: primary hyperparathyroidism, bone quality, bone mineral density, visceral adipose tissue

P1498

BONE MINERAL DENSITY IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS AND ITS CORRELATION WITH DISEASE ACTIVITY

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Objective: Systemic lupus erythematosus (SLE) is a multisystem autoimmune disease of unknown etiology, characterized by a very heterogeneous clinical picture. Osteoporosis and osteoporotic fractures are common in patients with SLE, they contribute significantly to morbidity and mortality, and they are primarily the result of systemic inflammation and treatment with glucocorticoids. The objective is to examine bone mineral density (BMD) in patients with SLE and its correlation with disease activity.
Methods: The retrospective study included 81 patients with SLE, hospitalized in the Clinic for Rheumatology, Institute "Niška Banja", who were diagnosed based on the revised ACR criteria from 1997. In addition to the clinical examination, BMD was measured at the level of the lumbar vertebrae L1-L4 and the hip using the method of dual-energy X-ray absorptiometry (DEXA) on a Hologic brand device. Osteoporosis and osteopenia are determined according to the definition of the World Health Organization. The level of disease activity was assessed by the prescribing physician for all patients using the Systemic Lupus Erythematosus Disease Activity Index (SLEDAI).
Results: The examined group consisted of 73 women (91.9%) and 8 men (9.9%), average age 46.3±9.6 years. The average duration of the disease of the examined group was 10.5±8.5 years. The results of the study showed that normal BMD was registered in 27 (33.3%) patients, osteopenia in 42 (51.9%), while osteoporosis was recorded in 12 patients (14.8%). The average value of the SLEDAI index in the examined group was 11.6±7.5 (median 9, minimum 0, maximum 36). In the subgroup with normal BMD values, the average SLEDAI values were 11.8±7.9, in patients with osteopenia 10.7±7.4, and in patients with osteoporosis 13.9±7.1. The mean value of the SLEDAI index was higher in the subgroup with osteoporosis compared to the group of patients with normal BMD and osteopenia, but the difference was not statistically significant. Spearman's correlation analysis indicates that there is no statistically significant correlation between the SLEDAI score and the bone mineral density of the spine (r=-0.065) and hip (r=0.035), expressed in g/cm^2.
Conclusion: Our results showed that osteopenia and osteoporosis are present in two thirds of patients with SLE, and that only one third of patients have normal BMD values. Patients with osteoporosis have higher disease activity compared to the group of patients with normal BMD and osteopenia, but the difference is not statistically significant. By examining the correlation of bone mineral density at the spine and hip with disease activity, it was shown that there is no association between disease activity and bone mineral density in patients with systemic lupus erythematosus.

P1499

SARCOPENIA ,THE GATEWAY FOR ELDERLY SUFFERING

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Sarcopenia is a geriatric syndrome characterized by a progressive and generalized loss of skeletal muscle mass and strength, resulting in reduced physical function and increased risk of adverse health outcomes in older adults. Skeletal muscle mass naturally declines with age, but sarcopenia represents an accelerated loss beyond the typical aging process. The etiology of sarcopenia is multifactorial, involving a complex interplay of age-related changes in anabolism, catabolism, inflammation, oxidative stress, and neuromuscular function. Additionally, various lifestyle factors, comorbidities, and genetic predispositions can contribute to the development and progression of sarcopenia. Sarcopenia is associated with a range of adverse health consequences, including increased risk of falls, fractures, disability, frailty, and mortality. It significantly impacts an individual's quality of life, independence, and overall health status. Early identification and intervention are crucial for mitigating the negative effects of sarcopenia and improving the health and well-being of older adults. Several strategies can help prevent and manage sarcopenia, including regular physical activity, particularly resistance training, adequate nutrition with sufficient protein intake, and addressing underlying medical conditions. Healthcare providers play a vital role in screening for sarcopenia, educating older adults about risk factors and preventive measures, and implementing appropriate interventions to optimize muscle health and function.

P1500

ONE-YEAR ADHERENCE OF ANTI-OSTEOPOROSIS MEDICATIONS AFTER HIP AND VERTEBRAL FRACTURE ON LONG-TERM MORTALITY: A REAL-WORLD EVIDENCE STUDY

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Objective
There exists a range of anti-osteoporosis medications designed to mitigate fracture risks and even mortality. Poor adherence to osteoporosis medications resulted in an approximately 50% reduction in the potential benefit observed in clinical trials. This real-world evidence study investigates the impact of adherence to anti-osteoporosis medicines for one year on long-term mortality.

Material and Methods
The study focused on individuals diagnosed with osteoporosis, having experienced significant fractures leading to hospitalization, as identified in Taiwan's National Health Insurance Research Database spanning from 2008 to 2021. Subjects with osteoporotic fracture who had used anti-osteoporotic medication (AOMs) within only one-year timeframe were selected and compared with the non-users. All subjects were followed as long as the mortality recorded or survival kept. Survival outcomes were analyzed using Cox proportional regression adjusted by Time-Dependent and inverse probability of treatment weighting (propensity score).
Results
A total of 164,527 subjects (10,945 AOMs users and 153,582 non-users) were enrolled with a mean follow-up period of 5.99±3.76 years. Most patients were women (72.5%), with a mean age of 71.84±11.92 years. Female subjects showed lower mortality than males. The older subjects and higher Charlson co-morbidity index showed higher mortality. Compared to non-users, one-year AOMs users with either hip fracture (HR 0.68, 95% CI: 0.67–0.70) or vertebral fracture (HR 0.65, 95% CI: 0.63-0.68) had significantly lower long-term mortality.
Conclusions
In conclusion, one year of anti-osteoporosis medication used for post-fracture treatment can significantly reduce long-term mortality in both hip and vertebral fracture.

P1501

COMPREHENSIVE INVENTORY OF BIOMARKERS ASSAYS: ANALYTICAL CAPABILITIES AND ADVANCED TECHNOLOGIES AT THE CHU OF LIÈGE

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To present a structured summary of the analytical capabilities and biomarker profiling performed in the Clinical Chemistry department of the CHU of Liège, particularly the Bone and Cartilage Marker Laboratory (BCML) in partnership with CARES sprl, a former spin-off of the University of Liege. This document provides a comprehensive inventory of more than 150 assays, detailing their clinical relevance and the advanced technologies employed to support diagnostic and research needs.
Material and Methods
The inventory was developed by reviewing over 10 years of laboratory records. The list was curated and regularly updated to retain only assays currently available in the laboratory. Each assay's description was based on peer-reviewed literature, ensuring accurate and standardized information on biological and clinical relevance. Biomarkers were grouped by their clinical applications, such as autoimmune diseases, metabolic disorders, and neurodegeneration. Key details, including analytical platforms (e.g., ELISA, LC-MS/MS, SIMOA, CLIA), detection principles, and clinical utilities, were systematically documented following international guidelines.
Results
The inventory includes biomarkers such as inflammatory cytokines (e.g., IL-6, TNF-α), neurodegenerative markers (e.g., tau proteins, neurofilament light chain), and metabolic indicators (e.g., vitamin D metabolites, leptin). The BCML leverages cutting-edge technologies, including ultra-sensitive SIMOA for single-molecule detection, high-precision LC-MS/MS for small molecules, and automated systems like Roche Cobas and Fujirebio Lumipulse for high-throughput immunoassays. Each entry provides a complete overview of the biomarker's clinical applications and analytical methods.
Conclusions
This document highlights the BCML and CARES extensive diagnostic and research capabilities, offering insights into its advanced technologies and expertise. It underscores the laboratory's role in supporting precision medicine and translational research, serving as a valuable resource for clinicians and researchers seeking high-quality biomarker analyses.

P1502

THE IMPACT OF THE PRESENCE OF RHEUMATOID ARTHRITIS ON TOTAL KNEE ARTHROPLASTY IN PATIENTS WITH OSTEOARTHRITIS

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Background
According to the results of previous studies, it has been reported that rheumatoid arthritis (RA) patients receive total knee arthroplasty (TKA) at a younger age than osteoarthritis (OA) patients. However, studies on the effect of RA on TKA are still insufficient.
Objectives
We conducted this study to find out how RA affects primary TKA and revision arthroplasty.
Methods
The data of OA and RA patients who underwent primary TKA and revision at Jeju National University Hospital between March 2003 and December 2022 were retrospectively analyzed. To exclude the effect of other connective tissue diseases, patients with SLE, Sjogren's syndrome, polymyalgia rheumatica, mixed connective tissue disease, undifferentiated connective tissue disease, Behcet's disease, systemic sclerosis, and vasculitis were excluded.
Results
A total of 5245 TKAs were performed, and the average age at primary TKA was 72.4 ± 6.4 years, and 2292 (85.7%) were female. When they were divided into OA group and RA group, RA knees were 159 (3.1%). The age at primary TKA in the RA group was significantly smaller (69.6 ± 6.8 vs 72.5 ± 6.4, p<0.001), and the female ratio was higher (91.9% vs 85.5%, P=0.031). Although the rate of revision surgery was not statistically significant, the RA

group had more (5.6% vs 3.1%, p=0.111), and the period to revision tended to be shorter in the RA group (33.8 ± 49.2 months vs 67.7 ± 56.1 months). month, p=0.078). The cause of reoperation was not significantly different between the two groups, but the rate of infection was higher in the RA group (55.6% vs 43.7), and reoperation due to loosening was more common in the OA group (46.2% vs 22.2%). There was no difference in other test values at the time of surgery, but in the RA group, ESR (43.8 ± 31.7 mm/h vs. 26.6 ± 22.6 mm/h, P<0.001), CRP (1.8 ± 2.3 mg/dL vs. 0.8 ± 2.1 mg/dL, p<0.001) was significantly higher.
The incidence of TKA was higher in the RA patients than OA patients (1436.2 per 100,000 Person-Years vs 1379.7 per 100,000 Person-Years). When comparing the risk of patients undergoing primary TKA during their lifetime by adjusting for gender, it was found that RA patients started receiving primary TKA at a younger age and had a significantly higher risk of undergoing TKA (HR 1.48, 95% CI 1.263–1.733, P<0.001).
As a result of logistic regression analysis, the increase in ESR (OR 10.2, 95% CI 1.01-1.03, P=0.001) and CRP (OR 1.09, 95% CI 1.01-1.17, P=0.021) at the time of primary TKA increase risk of revision arthroplasty, but RA did not.
Conclusion
Patients with RA have a higher risk of primary TKA and start primary TKA at a younger age, and the increased inflammation level at the time of primary TKA increase risk of revision arthroplasty, so it is recommended to perform primary TKA after inflammation is controlled.

P1503

WHOLE-BODY VIBRATION TRAINING IN COMBINATION WITH VITAMIN D FOR ENHANCING OSTEO-SARCOPENIA: A CLINICAL STUDY

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ABSTRACT: This research endeavors to probe into the impacts of whole-body vibration training (WBVT) in conjunction with vitamin D (Vit. D) supplementation on muscle quality and bone density among elderly individuals suffering from osteo-sarcopenia (OS). OS is a widespread geriatric syndrome that markedly compromises the quality of life in the elderly populace; however, research on its mechanisms and targeted pharmacological interferences is currently constrained. Muscles and bones interact via mechanical and chemical processes, and elucidating these interactions can contribute to the prevention and treatment of musculoskeletal disorders. In this investigation, we propose to quantify the levels of myokines irisin and myostatin (MSTN) in the serum of clinical subjects, while implementing WBVT combined with Vit. D supplementation as an intervention for OS patients. Dual-energy X-ray absorptiometry (DXA) will be employed to assess bone mineral density and muscle mass, while grip strength meter and 5-time chair stand test will be utilized to evaluate muscle strength. Additionally, 6-meter walk speed, Short Physical Performance Battery, and Timed Up and Go test will be used to assess physical function. The study will analyze the correlation between irisin/MSTN and OS, as well as the clinical efficacy and mechanism of action of WBVT combined with Vit. D in alleviating OS. The objective is to enhance the clinical diagnosis rate of OS, prevent OS complications at an early stage, facilitate the development of targeted pharmacological interventions for OS, provide a scientific basis for clinical diagnosis and treatment, improve the quality of life of the elderly, reduce the societal medical and economic burden, and make a substantial contribution to advancing medical and health technology in China.
KEYWORDS: Whole body vibration training; Vitamin D; Sarcopenia; Osteoporosis; Osteo-sarcopenia

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P1504

A NATIONAL SURVEY OF DXA QUALITY CONTROL PRACTICES AT TAIWAN TRAINING CENTERS

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Objective: We implemented a series of strategies to promote the accurate diagnosis of osteoporosis in Taiwan, including the use of NHANES III data as a standard reference, performance of BMD measurements at two or more skeletal sites, and initiation of DXA training programs since 2015. The aim of this report is to determine whether DXA quality measures at Taiwan's training centers comply with international practice guidelines.
Material and methods: All Taiwan Radiology Resident Training Centers were invited to complete a questionnaire regarding current DXA QA practices, especially in terms of skeletal sites scanned and reference databases used. Responders were DXA related leaders or responsible radiologists.
Results: All 37 and 39 centers were invited to participate in two time slots, in May 2018, and July 2020, respectively, with a 100% response rate. When comparing centers that responded in 2020 to those that responded in 2018, 82.1% and 76.3% respectively used the Asian reference database for Z-score tabulation; 84.6% and 65.8% respectively used the NHANES III reference database for T-score tabulation; and 89.7% and 86.9% respectively performed BMD measurements at 3 skeletal sites. The self-reported reasons for these improvements were related to DXA training

courses (n=3), following radiological guidelines (n=5), both (n=3), and manufacturers' changes in settings (n=2). The reasons why institutes did not comply with the guidelines regarding the use of the Asian reference database for Z-score tabulation and the NHANES III reference database for T-score tabulation, included an unwillingness to change examination procedures (n=2, n=1, respectively), no supporting software (n=1, n=2, respectively), and manufacturers' settings (n=3, n=3, respectively). The reasons why institutes did not follow the guidelines regarding measuring multiple skeletal sites (i.e. the spine and at least one hip) included national insurance reimbursement of one site only (n=1) and lack of operating procedure support (n=2). However, all centers had a comprehensive QC protocol and schedule.

Conclusion: This study provides a useful reference for centers to benchmark their DXA practices with national and international standards. These results also reflect the effectiveness of efforts to comply with international standards in Taiwan in terms of improving osteoporosis diagnostic accuracy.

P1505

EPIDEMIOLOGY AND MANAGEMENT OF OLECRANON FRACTURES: A NATIONWIDE REGISTER-BASED ANALYSIS OF 27,780 CASES IN DENMARK FROM 1999 TO 2018

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Objective

Olecranon fractures (OFs) account for approximately 20% of proximal forearm fractures [1, 2]. While OF management is well-studied, there is limited epidemiological data [1, 3]. This study investigates OF incidence rates (IRs), and treatment trends in Denmark over a 20-year period from 1999 to 2018.

Material and Methods

This study is a population-based register study on OFs in adult patients from 1999 to 2018 in Denmark. Patients ≥20 years diagnosed with an OF (ICD-10: DS520) were included. Next to age and sex, treatment was recorded. Treatment was classified as surgical if relevant surgical procedure codes were recorded within 21 days of OF diagnosis. IRs were calculated per 100,000 person-years using population data from Statistics Denmark.

Results

A total of 27,780 OF cases (61% female) were identified between 1999 and 2018. The overall mean IR was 33/100,000/year, increasing from 31 in 1999 to 41 in 2018. Females and males had similar IRs between ages 20–49 and ≥50 females had markedly higher IRs than males. Non-surgical treatment was predominant (67%, range: 64–72%). Surgical treatment was more frequent in females (36%, range: 30–42%) than in males (28%, range: 25–34%) and more frequent in patients ≥50 years (37%, range: 32-41%) than in patients <50 years (24%, range: 22-26). Over time, plate fixation (PF) use increased from 7% in 1999 to 45% in 2028. Tension band wiring (TBW) declined from 89% in 1999 to 46% in 2018.

Conclusion

The incidence of OFs increased by 29% over the 20-year study period, with increasing IRs seen mainly in females ≥50. Non-surgical treatment was predominant across all ages but increased markedly in older patients since 2013. Over the assessed two decades, PF increased and TBW decreased in popularity for surgically managed OFs. Future research should aim to identify which patients benefit most from surgical versus non-surgical treatment by incorporating patient-specific factors such as age, activity level, and comorbidities, thereby refining decision-making and optimizing outcomes.

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P1506

NUTRITION AND METABOLIC REGULATION: REVEALING NON-EXERCISE PATHWAYS LINKING HANDGRIP STRENGTH AND MORTALITY RISK

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Objectives : Handgrip strength (HGS) has emerged as a simple biomarker for evaluating muscle function and predicting mortality. Previous studies have shown that physical activity is associated with improved HGS, but there is limited research on the association between protein intake, insulin resistance and HCS. Therefore, this study investigates the novel role of nutrition and metabolic regulation, specifically protein intake and insulin resistance, as mediators in the relationship between HGS and mortality using NHANES 2001-2018 data.

Methods : This study enrolled 10362 participants from NHANES 2001-2018, with HGS categorized into low and normal groups. Mortality risk was analyzed across age, sex, and BMI subgroups. Mediation analyses were performed to evaluate the role of protein intake and insulin resistance in improving HGS and its subsequent impact on mortality. Adjusted hazard ratios (HRs) and 95% confidence intervals (CIs) were calculated.

Results : During 6.75 years of follow-up, a total of 840 all-cause deaths were recorded. Low HGS was significantly associated with increased mortality risk across all age, sex, and BMI groups. The association was most prominent in individuals aged ≥40 years, where HGS decline accelerated significantly. Mediation analysis revealed that 50% of the effect of protein intake on HGS improvement was mediated through reduced insulin resistance, highlighting a critical metabolic pathway. Surprisingly, the relationship between HGS and mortality was not mediated by physical activity,

suggesting that HGS may influence mortality through non-exercise pathways such as nutrition and metabolic regulation.

Conclusions : This study reveals the significant role of protein intake and insulin resistance in the relationship between HGS and mortality, independent of physical activity. HGS, as a simple clinical biomarker, can be effectively used for early screening marker. Interventions focusing on protein intake and metabolic regulation may provide novel strategies for improving population health and promoting healthy aging.

Keywords: Handgrip Strength, Mortality Risk, Protein Intake, Insulin Resistance

P1507

NEW INSIGHTS INTO THE ASSOCIATION BETWEEN TYPE 2 DIABETES AND OSTEOPOROSIS: THE IMPACT OF HEMOGLOBIN GLYCATION INDEX (HGI) ON OSTEOCLASTIC ACTIVITY

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Background

Osteoporosis is characterized by reduced bone mineral density (BMD) and deteriorated bone microarchitecture, leading to increased fracture risk. The hemoglobin glycation index (HGI), defined as the difference between observed and predicted HbA1c based on mean blood glucose, reflects advanced glycation end-product (AGEs) accumulation. HGI is emerging as a biomarker in diabetes and its complications. This study explores the association of HGI with BMD and its impact on osteoclast and osteoblast activities.

Methods

We enrolled 412 hospitalized patients with type 2 diabetes mellitus (T2DM). BMD was measured using dual-energy X-ray absorptiometry (DXA), and vertebral fractures were assessed via thoracolumbar radiography. HbA1c, blood glucose, and bone turnover markers (PINP, β-CTX, and OC) were analyzed. Correlations between HGI, BMD, and bone cell activity markers were examined. Mediation analysis was performed to determine whether osteoclastic activity mediates the HGI-BMD relationship.

Results

HGI was significantly higher in the vertebral fracture group compared to the non-fracture group (0.8 ± 2.1 vs. 0.3 ± 2.1, $p<0.05$). HGI negatively correlated with BMD ($r = -0.140$, $p = 0.005$) and positively correlated with β-CTX ($r = 0.15$, $p = 0.03$), but showed no significant association with P1NP ($r = 0.022$, $p = 0.755$). Mediation analysis revealed that osteoclastic activity explained 28.88% of the HGI-BMD relationship. Subgroup analysis by age showed a stronger correlation between HGI and BMD in patients ≥65 years compared to younger patients.

Conclusion

HGI is a potential contributor to bone loss in T2DM through its influence on osteoclastic activity, highlighting a novel link between diabetes and osteoporosis. While its effect on osteoblastic activity remains unclear, these findings suggest HGI as a target for future interventions to prevent osteoporosis and fractures in diabetic patients.

Keywords

Hemoglobin Glycation Index (HGI), Bone Mineral Density, Osteoporosis, Osteoclastic Activity, Type 2 Diabetes

P1508

EFFICACY OF TRADITIONAL CHINESE MEDICINE IN REDUCING FRACTURE INCIDENCE AND PROLONGING FRACTURE-FREE SURVIVAL IN BONE DISEASE PATIENTS

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Objective

Osteoporosis represents a major public health issue, significantly affecting human health and quality of life. In Taiwan, a considerable number of patients seek Traditional Chinese Medicine (TCM) as a complementary treatment. This study aims to compare the risk of fracture and fracture-free survival time between osteopenia and osteoporosis patients treated with specific TCM and western medicine (WM).

Material and Methods

A retrospective cohort study was performed using data from Taichung Veterans General Hospital, Taiwan. The cumulative dose criteria of TCM were set at 12g or more for single-herb medicines and 80g or more for formulas. A total of 420 patients were included, with 84 patients in the TCM group and 336 in the WM group. Propensity score matching was applied at a 1:4 ratio to balance baseline characteristics between the two groups, including age, gender, and T-score. Statistical tests such as Chi-Square test, Mann-Whitney U test, and Cox proportional hazards model were used to analyze the differences in fracture incidence and fracture-free survival time.

Results

The incidence of fractures was significantly lower in the TCM group (51.2%) compared to the WM group (94.6%) ($p<0.001$). The median fracture-free survival time was 2.2 years for the TCM group, while it was only 0.2 years for the WM group ($p<0.001$). The hazard ratio (HR) for fractures in the TCM group compared to the WM group was 0.38 (95% CI: 0.26-0.55). Additionally, TCM treatment was associated with a lower mortality rate compared to WM (19% vs. 6.3%, $p<0.001$).

Conclusion

This study demonstrates that the use of specific traditional Chinese medicine in osteopenia and osteoporosis patients is associated with a significantly lower risk of fractures and longer fracture-free survival time compared to western medicine. These findings suggest that TCM may provide an effective alternative treatment for reducing fracture risk in this patient population.

P1509

OSTEOPOROSIS SCREENING USING CHEST RADIOGRAPHS WITH A DEEP LEARNING MODEL (PROS CXR: OSTEO) AMONG A MULTI-ETHNIC POPULATION IN MALAYSIA: AN INTERIM ANALYSIS

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Objective: Osteoporosis, though common, is often underdiagnosed due to limited access to dual-energy X-ray absorptiometry (DXA) scans and reluctance to undergo screening among the public. A deep learning model, PROS CXR: OSTEO, has been developed to close these gaps using the chest radiograph (a cost-effective and widely accessible tool) in the South Korean population. Here, we aimed to externally validate PROS CXR: OSTEO in an urban, multi-ethnic population in Malaysia.

Materials and Method: We recruited participants aged ≥50 years and osteoporotic treatment-naïve from Universiti Malaya Medical Centre, Kuala Lumpur, Malaysia from September 2024 to January 2025. We excluded those with either chest implants or active lung diseases. Eligible participants underwent chest radiographs (posteroanterior erect) and DXA with the bone mineral density (BMD) for lumbar spine and femur measured. We classified them into 1) osteoporosis (BMD T-score ≤ -2.5) or 2) non-osteoporosis (T-score > -2.5) using the lowest measured T-score on DXA. We evaluated the correlation between PROS CXR: OSTEO model predictions and actual BMD-derived categories for differentiating osteoporosis and non-osteoporosis. We also examined for sensitivity, specificity, and area under the curve (AUC) using a binary classification decision threshold of 0.2. Subgroup analyses by ethnicity were also conducted.

Results: This interim analysis involved 100 participants (44% Malays, 38% Chinese, and 18% Indians). On DXA, 35% of the participants were classified as having osteoporosis, 49% with osteopenia, and 16% with normal BMD. The sensitivity of PROS CXR: OSTEO was 70.6%, with a specificity of 81.8% and an AUC of 0.850. When stratified by ethnicity, the AUCs were 0.890, 0.812, and 0.850 for Malays, Chinese, and Indians, respectively.

Conclusion: The PROS CXR: OSTEO deep learning model shows broad applicability across diverse populations for early screening of osteoporosis.

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Disclosures

LLL reports receiving honoraria for giving lectures from Amgen and Zuellig Pharma. Other co-authors have no conflicts of interest to disclose.

P1510

HOW DO RHEUMATOLOGISTS OF CREER GROUP MANAGE LEVEL 2 ANALGESICS

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Objectives:

Study the use of Level 2 analgesics by private practice rheumatologists (Rh) among the 7 most common diseases.

Investigate the perceived effectiveness and possible drug dependence of patients on some of these medications.

Material and Methods :

- 130 patients.
- W 71 %, with an average age of 67 years (women W = 70, men M = 59).
- Rheumatoid arthritis RA (7%), Ankylosing spondylitis AS (11%), Psoriatic arthritis PsoA(4%), Osteoarthritis OA (44%), Lower back pain LBP (26%), Radiculopathy (17%), and Fibromyalgia (3%).

Results:

Current Treatment (cur tt): Opium OP (33-57%), tramadol TR (30-40%), codeine C (13-25%), Nefopam and morphine at 7% (excluded). For both inflammatory or not conditions, the hierarchy is OP, TR, and C, except for AS.

1st tt: In both inflammatory or not, the order : TR = OP (30-42%), C (7-28%)

By conditions :

- Inflammation: A shift from equal use of OP and TR to greater reliance on OP in cur tt
- OA : OP = TR = C used initially but shifted to more OP in cur tt
- LBP : TR (30%) initially, OP = C (25%), shifting to TR (41%), OP (33%), and C (22%).
- Radiculopathy: 1st treatment was 42% OP, 29% TR, and 24% C, moving to 33% OP, 30% TR, 20% C.
- AS : Unique pattern with 1sr tt of 42% TR = OP, 17% C, shifting to 50% C, 21% TR = OP.
- Gender : M used OP, TR, C equally (30%), W used OP (49%), TR (38%), C (8%).
- Duration: The average duration of Level 2 analgesic use was 3.5 years regardless of the tt.

Effectiveness :

- In 1s^{t} tt, perceived effectiveness was for : OP 6/10, C 5.8/10, TR 5.5/10, often leading to tt changes. If effectiveness score = 7/10, changes were due to intolerance 22%, at 4.4/10, changes were due to ineffectiveness 56%.
- For cur tt, perceived effectiveness ratings were for : C 6,9/10, OP 6.6/10, TR 6.4/10.
- Frequency of daily doses decreased from 1st to cur tt, while weekly frequency increased, indicating improved effectiveness with changes.

Prescriptions:

- Initial treatment was initiated by Rh = general practitioners (Gp) (50%), with renewals by Rh.

- Cur tt was initiated by Rh 70% renewed by them 67%, Gp initiated 19% renewed 31%.
- 23% of patients modified doses in 1st tt..
- Cur tt, 27,3% reduced doses (W 71.4%); OP : 40%, TR :27%, C : 20%. 29% had LBP, 21% RA, 21% OA, 15% radiculopathy.
- 56% felt unable to stop their tt: 71% W, average age 63, 46% had OA, 45% used OP, 29% TR, 21% C, with daily use 84%. 15% believed they could reduce the dose, 11% would increase it.

Conclusion :
OP is the most prescribed Level 2 analgesic for both 1st and 2d tt, especially among W. An exception is AS : C = 50%. Product switches appear effective as usage frequency declines in 2d tt. Level 2 analgesics are extensively used in rheumatology, likely due to their effectiveness and tolerance over the long term. This study did not highlight addiction to these tt.

P1511

ROMOSOZUMAB INCREASED VERTEBRAL AND PROXIMAL FEMORAL STRENGTH IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS IN REAL-WORLD CLINICAL PRACTICE

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Objectives: Bone strength reflects the ability of bone to resist fracture. Limited data is available on the effect of romosozumab or other osteoporosis therapies on bone strength in real-world clinical practice. This study evaluated the real-world effectiveness of romosozumab (Romo) or teriparatide (TPTD) on vertebral and proximal femoral strength in Japanese postmenopausal women with osteoporosis using biomechanical computed tomography (BCT; VirtuOst®), an FDA-cleared diagnostic test.
Materials and Methods: In this retrospective observational study, 91 Japanese postmenopausal women with osteoporosis received Romo (n=57) or TPTD (n=34) for 12 months. None of them received osteoporosis treatment within 3 years of the index date. Vertebral strength, vertebral cortical and trabecular compartment strength, and proximal femoral strength were assessed before and after treatment, using BCT on a patient's routine clinical CT scan. BCT analyses were performed blinded to treatment status. The primary endpoint was percent change from baseline in vertebral strength at 12 months. Secondary endpoints included change in vertebral compartment and proximal femoral strength.
Results: At baseline, vertebral (including cortical and trabecular compartment strength) and proximal femoral strength were similar between Romo and TPTD groups. After 12 months of treatment, percent change in vertebral strength was 41.1% for Romo and 23.3% for TPTD (Figure). Percent change in vertebral cortical compartment strength was 38.4% for Romo and 15.9% for TPTD. Percent change in vertebral trabecular compartment strength was 40.3% for Romo and 30.9% for TPTD. These trends suggest that the treatment difference in overall vertebral strength was largely derived from the cortical compartment. Percent change in proximal femoral strength was 5.9% for Romo and 3.1% for TPTD (Figure).
Conclusion: Romo and TPTD increased vertebral strength in postmenopausal women with osteoporosis in real-world clinical practice, and the increase trended larger with Romo. Proximal femoral strength significantly increased with Romo, but not with TPTD after 12 months of treatment.
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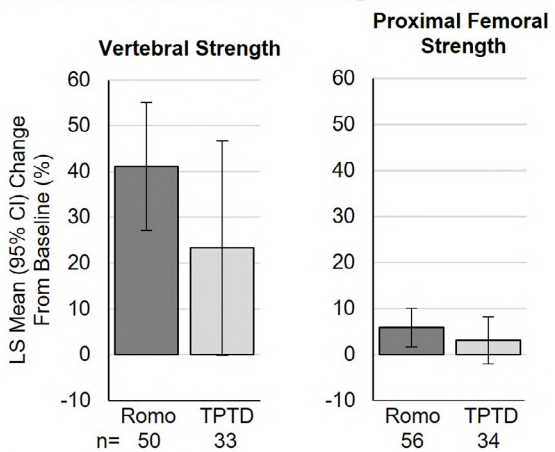
Figure: Percent Change from Baseline in Vertebral and Proximal Femoral Strength at Month 12



LS mean percent change was determined using generalized linear models adjusted for the patient's age at the index date, baseline value of the parameter, and fracture history. *CI, confidence interval; LS, least squares; Romo, romosozumab; TPTD, teriparatide.*

P1512

PREOPERATIVE OSTEOPOROSIS IN JOINT ARTHROPLASTY PATIENTS: A CALL FOR ROUTINE SCREENING AND MANAGEMENT IN CHINA

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Background: Osteoporosis is a leading contributor to periprosthetic fractures and elevated rates of long-term revision in joint replacement patients. Despite the significant global burden of osteoporosis, there is a lack of systematic studies investigating its prevalence among individuals undergoing joint replacement surgery, particularly in China, where the number of osteoporosis cas-

es is the highest worldwide. This study aimed to determine the prevalence of preoperative osteoporosis and the rate of osteoporosis treatment in patients undergoing joint replacement surgery.
Methods: We retrospectively analyzed patients aged 50 years or older who underwent total knee arthroplasty (TKA), unicompartmental knee arthroplasty (UKA), total hip arthroplasty (THA), or hemiarthroplasty (HA) at the Department of Orthopedics, the Second Xiangya Hospital, Central South University, between 2021 and 2023. Data on preoperative osteoporosis and related clinical aspects were collected and analyzed.
Results: A total of 1,736 patients were included in the study, comprising 811 TKA, 169 UKA, 697 THA, and 86 HA cases. Among these, 1,122 patients (64.6%) underwent dual-energy X-ray absorptiometry (DXA) testing prior to surgery. The prevalence of osteoporosis was 60.6% in TKA patients, 52.7% in UKA patients, 62.5% in THA patients, and 100% in HA patients. Notably, 75% of patients with comorbid arrhythmia, heart failure, or valve disease had osteoporosis, compared to 60.7% in those without these conditions. The overall treatment rate for osteoporosis was 68.6%, with most patients opting for denosumab over teriparatide or other oral medications. In terms of age distribution, the majority of patients (41.0%) were between 60 and 69 years old, and 54.5% of this age group were diagnosed with osteoporosis.
Conclusion: Osteoporosis is highly prevalent among joint replacement patients, particularly in HA, TKA, and THA cases, highlighting the need for routine DXA screening and targeted management.

P1513

RELATIONSHIP BETWEEN SERUM CHEMERIN LEVELS AND INFLAMMATORY MARKERS IN PATIENTS WITH OSTEOPOROSIS IN THE BACKGROUND OF RHEUMATOID ARTHRITIS

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Introduction
Numerous studies have shown that adipokines are actively involved in inflammation and immune responses in rheumatoid arthritis (RA) [1]. One of the relatively new representatives of adipokines is chemerin. The latter belongs to the cathelicidin/cystatin protein family, consisting of antibacterial proteins cathelicidins and cysteine protease inhibitors [2]. Chemerin is known to play both pro-inflammatory and anti-inflammatory roles, and higher levels of chemerin have been found in inflamed tissues and body fluids in various inflammatory diseases [3]. Data have been obtained that suggest that elevated systemic chemerin levels in RA patients may be associated with systemic inflammation [4]. Chemerin is involved in the initiation and resolution of inflammation and may be a useful biomarker in some inflammatory diseases, such as psoriasis and inflammatory bowel disease.
Objective: to investigate the possible relationship between serum chemerin levels in patients with osteoporosis in the background rheumatoid arthritis (RA) and classical markers of inflammation and disease activity

Material and methods.
We examined 110 patients diagnosed with osteoporosis (OP) against the background of RA, the age of the examined subjects ranged from 18 to 75 years. The duration of the disease was 8.9 years [3.1-15.4]. The early clinical stage of the disease was observed in 19 (17.3%) patients, advanced stage – in 43 (39.1%), and late stage – in 48 (43.6%) patients. Bone density was determined using Dual Energy X-ray Absorptiometry (DXA). The serum chemerin level was determined using the commercial Human Chemerin ELISA kit (BioVendor, Cat. No.: RD191136200R).
Results.
We studied the relationship between the chemerin level in the blood serum of patients with OP and RA and markers reflecting the activity and rate of disease progression. Moderate correlations were found between the chemerin level and the following inflammatory markers: CRP ($r=0.2728$, $p<0.05$), ESR ($r=0.3193$, $p<0.05$). A relationship was also found between the serum chemerin concentration and disease activity according to DAS28 ($r=0.2198$, $p<0.05$). Thus, the level of chemerin in patients with OP against the background of RA is associated with RA activity.
Conclusions.
These results confirm our assumption that chemerin is an important element of autoimmune processes in the body of patients with OP against the background of RA.
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P1514

CHEMERIN AS A LABORATORY MARKER FOR THE DEVELOPMENT OF ARTERIAL HYPERTENSION IN PATIENTS WITH OSTEOPOROSIS IN THE BACKGROUND OF RHEUMATOID ARTHRITIS

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Introduction
There are epidemiological data confirming the important role of chemerin in the development of cardiovascular pathology. In particular, there is a positive correlation between the concentration

of chemerin protein in serum and diseases such as atherosclerosis, hypertension and atrial fibrillation. It is believed that in heart failure, the level of chemerin can serve as a new prognostic indicator.
Objective:
to study the relationship between the level of chemerin in the blood serum of patients with osteoporosis in the background of rheumatoid arthritis (RA) and blood pressure levels.
Material and methods.
We observed 110 patients with osteoporosis (OP) against the background of RA a diagnosis of RA corresponding to the 2010 ACR/EULAB diagnostic criteria. The age of the patients ranged from 18 to 75 years, of which 93% were women and 7% were men. Bone density was determined using Dual Energy X-ray Absorptiometry (DXA). The serum chemerin level was determined using the commercial Human Chemerin ELISA kit (BioVendor, Cat. No.: RD191136200R).
Results.
We assessed the chemerin level in a group of healthy donors and patients with RA. The normal chemerin level in healthy individuals (calculated as M±2σ) ranged from 142.5 μg/ml to 257.3 ng/ml. The average chemerin level in RA patients was 495.6±168.49 ng/ml, which was significantly higher than the healthy donor levels — 178.6±45.81 ng/ml (t=-10.15; p<0.0001). The chemerin level was subject to normal distribution (K-S d=0.10621, p>0.2).
When conducting a correlation analysis of chemerin with blood pressure indicators, a connection was found with the level of SBP (systolic blood pressure) - (Spearman - R = -0.408491, p = 0.000805) and DBP (diastolic blood pressure) - (Spearman - R = -0.274877, p = 0.027935), which is completely consistent with the literature data on the negative correlation of chemerin levels and blood pressure. Next, we studied the diagnostic value of determining the level of chemerin for detecting arterial hypertension in patients with RA using the ROC analysis method. Based on the ROC curve analysis, it can be concluded that the level of chemerin, equal to 368.5 ng/ml, has 73.1% sensitivity and 26% specificity for detecting arterial hypertension in patients with OP and RA.
Conclusions.
Thus, a decrease in the concentration of chemerin in the blood serum can be used to identify patients with OP in the background of RA at risk of developing arterial hypertension.

P1515

PREVALENCE OF FALLING STATUS BASED ON WORK RELATED PHYSICAL ACTIVITY AMONG THE POPULATION IN IRAN: A NATIONWIDE STUDY

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Objective: This study aimed to investigate the prevalence of falls based on the amount of work-related physical activity among the adult population in Iran.
Material and Methods: Data from 2021 STEPwise Approach to Non-Communicable Disease Risk Factor Surveillance (STEPS) survey were analyzed, focusing on participants aged 18 years and older. To assess the work-related physical activity, individuals were asked about their moderate and vigorous work-related activity that lasted at least 10 minutes per week. The first group consisted of individuals who reported no physical activity, and remining participants were divided into two groups according to the median value of activity: group 2 (≥10 to <660 minutes/week) and group3 (≥660 minutes/week). Prevalence estimates were adjusted according to the sampling design, and percentages with 95% confidence intervals (CIs) were reported for the overall population and by sex. A non-parametric trend test was used to evaluate the trend of an ordinal variable across another group.

Table 1. Prevalence of Falling Based on Work Related Physical Activity Among Iranian Population

Variables	Group 1 No physical activity (n=397)	Group 2 Physical Activity at Work ≥10 to <660 minutes/week (n= 131)	Group 3 Physical Activity at Work ≥660 minutes/week (n=135)	p value-trend
Total	2.20 [1.96,2.46]	3.01 [2.51,3.64]	3.10 [2.58,3.72]	<0.001
Sex				
Female	2.23 [1.94,2.57]	3.47 [2.74,4.40]	3.31 [2.41,4.53]	0.003
Male	2.15 [1.78,2.58]	2.47 [1.83,3.32]	3.01 [2.40,3.76]	0.025

Summary statistics are weighted according to sex, age, and residence (urban/rural) based on the 2016 Iranian census
Results are reported as percentages along with 95% confidence intervals (CIs) for categorical variables

Results: Out of 27,560 participants, 663 individuals reported a history of falls in last 12 months. The mean age [standard error: SE] of individuals who experienced falls was 51.4 years [SE = 0.72]. Additionally, 56.5% [95% CI: 52.2,60.8] of these individuals were females. The highest prevalence of falls was observed in the entire population and specifically among males who engaged in 660 minutes or more of physical activity per week, with prevalence rates of 3.10 [95% CI: 2.58,3.72] and 3.01 [95% CI: 2.40,3.76], respectively. In the overall population, as well as among both males and females, the prevalence of falls increased with higher levels of physical activity, and this trend was statistically significant (P<0.05).
Conclusion: The findings indicate that the prevalence of falls increases with higher levels of physical activity. It is recommended that future observational-analytical studies investigate the causes of falls during physical activity.
Keywords: Falls, Iran, Physical Activity, Prevalence

P1516

IN WHAT WAYS DOES THE SITE OF OSTEOARTHRITIS AFFECT THE QUALITY OF LIFE?

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Introduction :
Osteoarthritis (OA) is a common and progressive joint disorder characterized by the degeneration of cartilage . It affects any joint, but it most commonly impacts the knees and hands. It can lead to physical and mental fatigue .
Objectives :
The aim of the study was to describe the quality of life in patients with osteoarthritis, and to predict the impact of its location on both physical and mental aspects .
Methods :
This was a cross-sectional study consecutively including patients followed in the Rheumatology department for osteoarthritis. We used the short form SF-12 questionnaire to assess the quality of life. The statistical analysis was done by SPSS software.
Results :
A total of 72 patients were included in the study (77,8% women and 22,2% men) with a mean age of 68 ± 8.79 years [50-91]. Most common comorbidities were hypertension(59,7%),diabetes (33,3%) , cardiac disorders (23,6%) , osteoporosis (27,8%) and rheumatoid arthritis (13,9%).
The average BMI was 35.17 ± 5,21 [26- 39] Knee osteoarthritis was isolated in 44 patients (61,1%) .Osteoarthritis of the hand was isolated in 20 patients (27,7%) .
The average mental quality of life (MCS) score in Knee osteoarthritis was 48,43 ± 13,12, the average physical quality of life (PCS) score was 40 ± 14,3. Both were below the average health status.
Therefore, in osteoarthritis of the hand ,The average mental quality of life score was 48,13 ± 15,12, while the average physical quality of life score was 36 ± 14,3. Both were below the average health status.
No matter the location , the physical impact of osteoarthritis was remarkably more important than the mental impact .
Therefore PCS was more altered in patients with osteoarthritis of the hand .
Conclusion :
The quality of life of individuals with osteoarthritis is deeply influenced by the location of the affected joints. Osteoarthritis of the hand can significantly impair an one's independence, especially when fine motor skills are required.

P1517

PROFILE OF PATIENTS WITH COXOPATHIES: A CROSS-SECTIONAL STUDY OF 40 PATIENTS

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Introduction :
The hip joint is a crucial component for the body's mobility and stability . Understanding its diverse disorders , their etiologies and manifestations is crucial for early diagnosis and effective management.

Objectives :
This aim of this study was to explore the spectrum of hip joint anomalies, their clinical presentation, diagnostic approaches, and treatment strategies to provide a comprehensive overview for improving patient outcomes.

Methods :
This was a cross-sectional study conducted over a period of two years [2022-2024], including patients with coxopathies who were followed at the Rheumatology Department of Fattouma Bourguiba Hospital in Monastir.

Results :
Our study included 40 patients (27 men and 13 women).Sex ratio (M/F) was 2.07 . The mean age was 44.42 ± 2.95 years. The most common comorbidities among our patients were hypertension, diabetes, and dyslipidemia in 25%, 10%, and 6% of cases, respectively. Metabolic syndrome was noted in 10 patients. The most frequent clinical manifestations were, in descending order of frequency: groin pain, hip limitation, and morning stiffness, reported in 100%, 97.5%, and 82.5% of cases, respectively. Bilateral involvement was noted in only 5% of cases. An inflammatory biological syndrome was present in 47.5% of patients. Standard radiographs showed hip joint involvement, frequently represented by joint space narrowing, geodes, osteophytosis, and femoral head flattening in 65.5%, 27.5%, 10%, and 5% of cases, respectively. A pelvic MRI was requested for 21 patients (52.5%). The most common etiologies, in order of frequency, were inflammatory coxitis, coxarthrosis, avascular necrosis of the femoral head, and septic coxitis, in 62.5%, 12.5%, 10%, and 5% of cases, respectively. Bone tumors, chondrocalcinosis, and Paget's disease were noted in only one patient each. Sixty-seven percent of patients (67%) were treated medically with good symptom improvement. Two patients received ultrasound-guided hip infiltration. Synoviorthesis was indicated in 22.5% of cases. Surgery was required for only 2 patients (5%).

Conclusion :
Early and accurate diagnosis is critical for tailoring appropriate treatment approaches, which can significantly alleviate symptoms and prevent long-term complications.

P1518

UNITING THE DICHOTOMY BETWEEN PRIMARY AND SECONDARY PREVENTION OF OSTEOPOROSIS – BONE AND MUSCLE HEALTH RELATED CHARACTERISTICS IN CARE HOME RESIDENTS IN EGYPT: A COMMUNITY- BASED INTERVENTION BY THE EGYPTIAN ACADEMY OF BONE AND MUSCLE HEALTH

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Background:
The care home population represent a population at potentially high risk of fracture, who may benefit from targeted bone and muscle health screening and prevention strategy. However, the characteristics of care home populations, with respect to fracture risk and subsequent care, have not been well-defined in Egypt. In concordance with the ground-breaking collaboration between the WHO with ESCEO / IOF for the prioritization of osteoporosis and fragility fracture prevention within global healthcare policy, a project has been launched to lay the groundwork for a national approach for promoting bone and muscle health as well as prevention of osteoporosis and fragility fractures in Egypt.
Objective: To describe the bone and muscle health characteristics and risk factors among care home residents, including fracture, sarcopenia and falls risk factors, fracture rates, nutritional and psychological status as well as functional abilities.
Methods:
Design: A prospective cohort study of care home residents aged ≥50 years in Egypt
Methodology: This is a national quality improvement program that adopts "Plan, Do, Study, Act
(PDSA) cycle methodology". The project is a joint activity provided by the Egyptian Food bank
and the Egyptian Academy of Bone and Muscle Health in collaboration with the ministry of
Social Solidarity. All adults/older adults living in care homes in greater Cairo, Egypt, aged 50-years and above have been invited to join this project of primary prevention of osteoporosis. Every participant completed a questionnaire to assess for Fracture risk (FRAX-Egypt), Falls risk (FRAS), Sarcopenia Risk (SARC-F), functional disability (HAQ), as well as comorbidities and past history/ current medications intake. Assessment of bone mineral density (DXA scan) was carried out for every subject. Exercise program has been provided by local physio teams under supervision of the Rehab physicians to reduce sarcopenia and fall risk. Patient education and counselling program have been provided by the treating doctors. Blood tests for Vitamin D serum levels and bone profile were carried out for all subjects. Assessment of the nutritional status (Mini Nutritional Assessment), psychological status (GHQ-30 questionnaire) as well as mental status (Mini Mental State Examination (MMSE) were carried out for every subject. Osteoporosis therapy as well as calcium and vitamin D supplementation were provided for those participants diagnosed to have osteoporosis or at high/very high fracture risk.
Results:
357 subjects were included in this work. 37% of the care home residents were men (mean age 71.3 whereas 63% were women (mean age 72.7-years). 91% were non-smokers whereas 9% were smokers. 25% were diabetics. 81% were vitamin D deficient, 9% were insufficient, whereas 10% were sufficient. 65% had high sarcopenia risk, whereas 47% had high falls risk. There was severe physical disability in 17% of the subjects included, 30% were moderate to severe, whereas 53% had mild to moderate disability. The prevalence of depression was 60% whereas 38.4% were found to have cognitive impairment. 23% had past history of fragility fractures, whereas 77% did not. 31% of the females had high 10-year probability of hip fracture, in contrast to 16% of the men. DXA revealed 47.2% were osteoporotic. Adding the osteoporotic subjects to those who have high or very high fracture risk, mounted to 63.8% require osteoporosis therapy which was commenced accordingly.
Conclusion: The characteristics of care home populations with respect to bone and muscle risk factors have not been well-studied, and limited information is available from Egypt. This study revealed that care home residents have fracture, sarcopenia and falls risk factors which are comparable to the national figures. There is an opportunity for clinicians to reduce the gap in osteoporosis diagnosis and treatment.

P1519

FIXED INTERVENTION THRESHOLDS VS AGE-DEPENDENT FRAX-BASED ASSESSMENT FOR THERAPEUTIC DECISION MAKING IN OSTEOPOROSIS. BY THE EGYPTIAN ACADEMY OF BONE AND MUSCLE HEALTH

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Background: The use of FRAX (fixed or age-dependent thresholds) as the gateway to assessment identifies individuals at high risk has been reported to be more effectively than the use of BMD. Whilst fixed intervention thresholds for osteoporosis management are set at a specific percentages, age-dependent thresholds (developed based on the probability of a major osteoporotic fracture) are based on the idea that if a person with a certain fracture probability is eligible for treatment, then anyone with the same

probability should be eligible. Fixed thresholds can help avoid overtreating young patients, who are less likely to fracture. On the other hand, age-dependent thresholds can lead to undertreating older patients, who may still require intervention due to other risk factors. More recently a hybrid threshold has been adopted. Hybrid thresholds are a combination of age-specific thresholds up to age 70 and a fixed threshold for older ages. For men and women under 70, the threshold is set at the same risk as a woman of the same age who has had a previous fracture. For people 70 and older, fixed thresholds are used. This model is used to reduce inequalities in treatment, which can occur when younger people are overtreated and older people without a history of fractures are undertreated.

Objective: To compare the fixed intervention thresholds (Its) to the age-dependent intervention thresholds applied to the Fracture Risk Assessment (FRAX) tool in therapeutic decision making for both post-menopausal women and men with osteoporosis.

Methods: Data were collated from treatment-naïve 169-postmenopausal women and 51-men aged 40-85 years who sustained osteoporotic fragility fracture. Pre-fracture FRAX was calculated to assess the probability of developing a low trauma fracture. Both Fixed intervention threshold and age-dependent ITs, for both major osteoporotic fracture (MOF) and hip fracture (HF), were calculated considering a woman with a BMI of 25 kg/m2, aged between 40 and 85years, with a prior fragility fracture, without other clinical risk factors. The best cut-points were determined considering the optimum sensitivity and specificity using receiver operating characteristic analysis [1]. Those with fracture probabilities equal to or above upper assessment thresholds (UATs) were considered to have high fracture risk. Those below the lower assessment thresholds (LATs) were considered to have low fracture risk.

Results:

For post-menopausal women, there was discrepancy between Fixed ITs and age dependent Its in 16% of the patients which was equally distributed in both ITs. The mean age of the Fixed ITs cohort was 75.4 years whereas for the age dependent was 53.8 years. 38.5% of the age dependent post-menopausal cohort had oophorectomy/ early menopause whereas 30.8% had secondary causes (Diabetes, hypertension, asthma). In the Fixed ITs cohort, 61.5% had secondary causes whereas 15.4% had early menopause ($p< 0.01$). Whilst age-dependent ITs performed better in younger patients, it lead to undertreatment of older patients.

For the men group, there was significant discrepancy between Fixed ITs and age dependent. Fixed ITs performed significantly ($P<0.001$) better than the age-dependent ITs in identifying the fracture probability. Age-dependent ITs (developed based on its values in women) underestimated the fracture risk in men at all age groups. 35.3% had secondary causes (Diabetes, hypertension, asthma) in the men's cohort which was not significantly different from the women cohort.

Conclusion:

Fixed ITs performed better as a screening tool for the fracture risk probability, particularly for men. FRAX-plus is of value to facilitate the inclusion of risk factors in the final fracture risk assessment. FRAX-based intervention thresholds should be developed specific for men with osteoporosis. Country specific intervention thresholds are needed

P1520

VITAMIN D MANAGEMENT UPDATE: EVIDENCE-BASED GUIDELINES FOR VITAMIN D OPTIMIZATION. BY THE EGYPTIAN SOCIETY FOR BONE AND MUSCLE HEALTH

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Background Vitamin D plays a crucial role in bone health, calcium homeostasis, and prevention of chronic diseases. Deficiency and insufficiency of vitamin D poses a global health concern, particularly in specific populations such as the elderly, individuals with limited sun exposure, and those with dietary restrictions. The Egyptian Academy for bone and muscle health is issuing an updated guideline influenced by a substantial body of research conducted in recent years. for the diagnosis, prevention, and management of vitamin D deficiency.

Objective: To establish clear, evidence-based guidelines for healthcare professionals and the public on the why, how and when to recommend vitamin D supplementation with objectives to optimize vitamin D levels, prevent deficiency, minimize adverse effects, and inform public health policies.

Methodology The guideline development conformed to the Meta-Analyses guidelines and Preferred Reporting Items for Systematic Reviews. It synthesizes evidence from clinical studies and expert consensus on vitamin D requirements across different age groups and health conditions. 32 key clinical questions were identified using the Patient/Population, Intervention, Comparison, and Outcomes (PICO) framework. Review of the literature review was carried out to evaluate the benefits and risks of available pharmacologic and nonpharmacologic therapies for vitamin D insufficiency and deficiency. The level of evidence was assessed adopting the Oxford Centre for Evidence-based Medicine (CEBM) system. Based on this evidence, recommendations were developed, with A 3-round online Delphi process involving 10 experts was carried out to achieve consensus on the direction and strength of the recommendations.

Results Recommendations include daily intake guidelines, test-

ing protocols, management of deficiency, and public health interventions. The role of empirical vitamin D dosing in high-risk individuals was emphasized. Key considerations include age, body weight, lifestyle, dietary habits, individual health risks as well as comorbidities. Testing is recommended for symptomatic individuals or those with specific conditions such as osteoporosis or renal impairment. The guideline highlights the role of FGF23 in high dosing of vitamin D, relation between vitamin D deficiency and fall risk, it encourages oral over intramuscular administration and discourages routine population-wide screening.

Conclusion Effective management of vitamin D levels involves tailored supplementation strategies based on individual needs and risk factors. Maintenance of serum 25(OH)D levels above 30 ng/mL is advised for optimal health outcomes. Public health efforts should focus on lifestyle modifications, safe sun exposure, and dietary education, alongside targeted supplementation for at-risk groups.

P1521

LONGITUDINAL PATTERNS OF PHYSICAL ACTIVITY, SEDENTARY BEHAVIOUR AND SLEEP LIFESTYLE IN A REPRESENTATIVE SAMPLE OF EGYPTIAN POPULATION 50-YEARS AND OLDER: A CROSS-SECTIONAL STUDY

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Background:
In 2018, the World Health Assembly (WHA) approved a new Global Action Plan on Physical Activity (GAPPA) 2018–2023 and endorsed a global target to reduce global levels of physical inactivity in adults and adolescents by 15% by 2030. Egyptian older adults, similar to those in industrial countries, have also reported a lack of physical activity. Earlier data revealed that less than 10% of the older Egyptian population practice regular exercises; of them, the most inactive population were those over the age of 60 years old [1]. Providing clinicians with a tool that enables them to assess their patients for their level of physical activity as well as sedentary and sleep behaviour would have a positive impact on their strategy of management.

Objective:
1. Assess the pattern of physical activity, sedentary behaviour, and sleep behaviour among the Egyptian men and women older than 50 years old using the self-reported sedentary, physical activity, and sleep quality self-assessment questionnaire (SASA);
2. Evaluate the prevalence of non-communicable diseases in this cohort of the population and its relation to the physical activity level.

Methods:
Design: a prospective community bases study.
Participants:
Inclusion criteria: Self mobilized Egyptian men and women aged 50 years and older.
Exclusion criteria: Dementia patients, users of assistive devices that greatly affect physical activity (wheelchair lifestyle and limb prosthesis), patients taking medications that affect their sleep or physical activity, and non-Egyptians have been excluded from this work.
Methodology:
Every subject was invited to complete the self-reported sedentary, physical activity, and sleep quality self-assessment questionnaire (SASA). The questionnaire is composed of 14 questions stratified into 3 domains, namely, to assess: 1. Sedentary activity (4 questions), 2. Physical activity (4 questions), 3. Sleep behaviour (6 questions). The 14-item questionnaire ranges from a sedentary lifestyle to regular and strenuous physical activity and from strength training to flexibility-enhancing exercises. The instructions for completing the questionnaire are based on a brief description with illustrations of the three levels of physical activity (light, medium, and intense) to help judge the type of activities in each category. It takes a maximum of 5 min to complete it. For every question, there are 3 response options, with scores ranging from 0-2. The score obtained by the respondent can be classified into one of the following three levels: (1) Sedentary lifestyle: 0-<4: sedentary, 4-6 borderline, & >6: non-sedentary; (2) Physical activity: 0-2: inactive, >2-4: less than active, & >4: active; (3) Sleep: 0-3: poor sleep quality, 3-9: fair sleep quality, 9-12: good sleep quality. The presence of comorbidities, namely obesity, type II diabetes mellitus, hyperlipidaemia, hypertension, coronary artery disease, stroke, and cancer, has been recorded.
Results:
679 participants 50-years and older were included in this work: 276 males (40.65%) and 403 females (59.35%), mean age: 58.3 ± 6.71 years. The mean BMI was 30.32 ± 6.62 and was significantly higher among the female' participants (31.2 ± 8.7 compared to 27.3 ± 5.8 in male patients; $p < 0.001$). About 27% of the participants were illiterate, while the remaining individuals had varying educational levels, with 6.63% having completed postgraduate studies.
The prevalence of the 3 main components of the questionnaire are shown in table (1).
The most common comorbidity among the participants was arthritis, followed by hypertension and type 2 DM (41%, 39.32%, and 23%, respectively). Arthritis was significantly higher among females ($p < 0.001$).
Results of multivariate regression analysis showed that age, female sex, and high BMI were predictors of low PA score. Women were 1.2 times more likely to be physically inactive; moreover, those with poor sleep quality were more likely to be physically inactive (95% CI=0.09, P=0.0042).

Table (1): Prevalence of the 3 main components of the SASA questionnaire in Egyptian men and women

		Gender		
Term	**Overall N (%)**	**Male N (%) (n=276)**	**Female N (%) (n=403)**	**p-value**
Sedentary (category)				0.925
Sedentary	63 (9.28)	27 (9.8)	36 (8.9)	
Borderline	366 (53.9)	147 (53.3)	219 (54.3)	
Active	250 (36.82)	102 (37)	148 (36.7)	
PA (category)				**< 0.001*** **
Inactive	388 (57.14)	127 (46)	261 (64.8)	
Borderline	83 (12.22)	27 (9.8)	56 (13.9)	
Active	208 (30.63)	122 (44.2)	86 (21.3)	
Sleep quality (category)				0.126
Poor	20 (2.95)	8 (2.9)	12 (3)	
Fair	452 (66.57)	172 (62.3)	280 (69.5)	
Good	207 (30.49)	96 (34.8)	111 (27.5)	
α = 0.05. p < 0.05*, p < 0.01, p < 0.001*** **				
P-values obtained from Fisher's exact test				
		Gender		
Term	**Overall**	**Male**	**Female**	**p-value**
Sedentary	Med (IQR) 6 (2)	6 (2)	6 (2)	U: 0.6628
PA	Med (IQR) 0 (5)	4 (6)	0 (4)	**U: <0.001*** **
Sleep quality	Med (IQR) 7 (3)	8 (3)	7 (3)	**U: 0.0030****
α = 0.05. p < 0.05*, p < 0.01, p < 0.001*** **				
P-values obtained from two-sample t-test (t) or Mann-Whitney test (U)				

Conclusion: Worldwide, growing number of adults are not doing the recommended physical activity, which in turn is expected to increase the number of people living with non-communicable diseases (NCDs). it is recommended that Egyptians should consider doing physical activities as part of their standard routine. Older adults should do varied multicomponent physical activity at moderate or greater intensity on 3 or more days a week in order to enhance functional capacity, prevent falls and ensure high quality sleep.

P1522

FRAX-BASED INTERVENTION THRESHOLDS FOR OSTEOPOROSIS MANAGEMENT IN 6-ARABIC COUNTRIES: IMPACT ON PATIENTS' MANAGEMENT

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Background: Currently, country-specific, age-dependent FRAX is available in ten of the fourteen Middle Eastern countries, including the United Arab Emirates, Egypt, Iran, Jordan, Kuwait, Lebanon, Palestine, Qatar, Saudi Arabia, and Syria. The FRAX® models have been adjusted for the various countries by incorporating country-specific fracture and mortality rates taken from national or regional sources.

Objective: This study aimed to compare the outcome of implementing age-specific intervention thresholds for both major osteoporotic fractures as well as hip fracture in some of the Middle Eastern countries where FRAX models are available.

Methods: The 10-year probability of both major osteoporotic fracture as well as hip fractures were assessed for 237 patients (51 Males and 186 Females) who sustained osteoporotic fractures. The risk was calculated using their risk factors prior to the occurrence of the index fracture. The age-specific 10-year probabilities of a major osteoporotic fracture (MOF) as well as hip for a woman with a BMI of 25.0 kg/ m2, without BMD were calculated as intervention Threshold (IT). The sensitivity of the fracture risks were compared using Kappa statistics amongst Egypt, Emirates, Jordan, Lebanon, Saudi Arabia and Qatar.

Results: The sensitivity of the different age-specific intervention thresholds for major osteoporotic fractures ranged from 24% to 51.9% among women below 70-years old, whereas it ranged between 24.3% to 62.6% for women over 70-years old. For hip fractures, the sensitivity ranged from 36% to 76% in women under 70-years old and 80.2% to 90% in women over 70-years old. In men, under 70-years old, the sensitivity ranged from 27.3% to 54%, whereas over 70-years the sensitivity ranged from 62.1% to 72.4%. Kappa agreement of risk of fractures using major fracture FRAX revealed significant relation between all the Arab countries in both men and women ($p < 0.001$). Similar significant relation was noted at the hip fracture side.

Conclusion: Inspite of the heterogeneity of the intervention thresholds among individuals of different ages in the studied Arabic countries, there was a significant relation amongst all those countries in identifying those at risk of developing osteoporotic fractures. These intervention thresholds provide valuable insights to make informed decisions regarding osteoporosis management. Development of country-specific fixed interventional thresholds might be an approach to improve the sensitivity of the cut-off thresholds for osteoporosis management and to facilitate screening and management of the patients according to the national clinical guidelines.

P1523

THE ASSOCIATIONS BETWEEN MEETING 24-HOUR MOVEMENT GUIDELINES (24-HMG) AND SELF-RATED PHYSICAL HEALTH IN ADULTS AND OLDER ADULTS—CROSS SECTIONAL EVIDENCE FROM EGYPT. BY THE EGYPTIAN ACADEMY OF BONE AND MUSCLE HEALTH

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Background: The 24-HMG recognize that physical activity, sedentary behavior, and sleep are interconnected behaviors that influence health. These guidelines emphasize the importance of a balanced approach to movement throughout the day. Meeting the 24-hour movement guidelines is expected to match the self-rated physical health in adults and older adults. This way, the more 24-HMG guidelines met, the better the self-rated physical health in both adults and older adults.

Objectives: This study determined the prevalence of adults and older adults (aged 50-years and
older) meeting the Egyptian 24-hour movement guidelines alone and in combination, and their
association with the self-rated physical activity.

Methods: Participants included were Egyptian men and women aged 50-years and older (age, 67.37 ± 0.08 years; 46.87% male). Physical health scores were obtained for every subject who was asked to complete a copy of the self-Assessment (SASA) questionnaires. The criteria for meeting the 24-hour movement guidelines were: physical activity time ≥ 150 min/week, sedentary time ≤ 480 min/day, screen time ≤ 180 min/day, sleep time 7-9 hours. The questionnaire is composed of 14 questions stratified into 3 domains, namely, to assess: 1. Sedentary activity (4 questions), 2. Physical activity (4 questions), 3. Sleep behaviour (6 questions). For every question, there are 3 response options, with scores ranging from 0-2. The score obtained by the respondent can be classified into one of the following three levels: (1) Sedentary lifestyle: 0-<4: sedentary, 4-6 borderline, & >6: non-sedentary; (2) Physical activity: 0-2: inactive, >2-4: borderline, & >4: active; (3) Sleep: 0-3: poor sleep quality, 3-7: fair sleep quality, 7-9: good sleep quality.

Results: The proportion of older people meeting three of the Egyptian 24-hour movement guidelines
was 4.16%, the proportion meeting two guidelines was 28.19% and the proportion meeting one
guideline was 39.14%. The number of people meeting 24-hour movement guidelines was closely
related to the self-rated physical health in both adults (50-60 years old) and older adults (60-years
old and higher) Egyptians.

Table: The prevalence of the different patterns of behaviour among Egyptian adults and older adults

Variable	N (%)
Weekly Physical Activity-time	
<150 minutes	492 (72.46%)
150 minutes or more	187 (27.54%)
Daily sedentary time	-
>480 minutes	429 (63.18%)
480 minutes or less	250 (36.82%)
Screen-time	-
>180 minutes	403 (59.35%)
180 minutes or less	276 (40.65%)
Sleep duration	-
7-9 hours	243 (35.79%)
Otherwise	436 (64.21%)

Conclusion: A relatively small proportion of older people met all the 24-HMG recommendations, highlighting the need to promote and support the adherence to these movement behaviours. To improve self-rated physical health, it is essential to encourage individuals to adopt healthy lifestyle habits that align with the 24-HMG. This can be achieved through: education and awareness campaigns, creating supportive environments (promoting active transportation, providing access to safe and accessible recreational spaces, and creating workplace wellness programs) and tailored interventions.

P1524

TARGETING THE MUSCLE–BRAIN AXIS: THE RECIPROCAL RELATIONSHIP BETWEEN COGNITIVE IMPAIRMENT AND SARCOPENIA- DOES IT REPRESENT A NEW PARADIGM IN SARCOPENIA?

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Background: Cognitive impairment and sarcopenia are increasingly linked, with research showing that individuals experiencing muscle loss and weakness associated with sarcopenia are also more likely to exhibit cognitive decline, particularly in areas like

processing speed and executive function; this connection suggests a potential shared underlying mechanism between muscle health and brain function, although the exact pathways are still being investigated. This work was carried out by the Egyptian Academy of Bone and Muscle health in collaboration with the Food Bank Egypt.
Objective: To evaluate the bidirectional association between sarcopenia and cognitive impairment in a community based assessment.
Methods: This was a cross-sectional study carried out to assess sarcopenia and cognitive function amongst adults (over 50-years old) and older adults (176-subjects, 115 females and 61 males) living at care homes in Egypt. Assessment for risk of sarcopenia in cognitive impaired patients was carried out using SARC-F questionnaire. To quantitatively assess for sarcopenia, every subject was evaluated for: 1. Muscle strength: this included: measurement of the Handgrip strength; 2. Dynamic strength tests: including chair stands or timed up-and-go tests as well as, 3. Muscle function: Gait speed: Measures walking speed over a 4-meter distance. Cognitive impairment assessment was carried out using the Mini-Mental State Examination (MMSE) tool. Falls risk assessment was assessed by using the Falls Risk Assessment Scale (FRAS). Statistical analysis was carried out to analyse the relationship between sarcopenia and cognitive impairment.
Results: There was significant association ($p< 0.01$) between sarcopenia measures and cognitive decline. 66% of the patients with cognitive impairment had high SARC-F score. Assessment of muscle strength in subjects with cognitive impairment revealed that the prevalence of weak hand grip was 86%, whereas assessment of dynamic strength tests revealed chair stand test was impaired in 81.4% and time-up-and-go was impaired in 53.5%. Similar significant association ($p< 0.01$) was reported on assessment of outcome of muscle function which revealed impaired gait speed in 95.3% in subjects with cognitive impairment. Patients with cognitive impairment were at high risk of falls with mean Falls risk score of 4.84 ± 0.6 ($P<0.5$) in comparison to subjects without cognitive impairment.
Conclusion: Sarcopenia is significantly associated with an increased risk of cognitive impairment. This raises the possible role for muscle-derived mediators (myokines) in mediating muscle–brain crosstalk and highlights the importance of promoting muscle health through exercise and nutrition as a potential strategy for preventing cognitive decline in older adults.

P1525

PREVALENCE OF FALLS IN THE OLDER ADULTS: RESULTS OF A NATIONWIDE REPRESENTATIVE STUDY

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Objective: This study investigates the prevalence of falls among Iranian individuals aged 50 and above, while also identifying specific populations at increased risk.
Methods: Data from 10,883 Iranian participants in the STEPS survey (STEPwise approach to non-communicable disease risk factor surveillance) were analyzed. The weighted prevalence of falls was reported in different categories of sex, employment status, residence, marital status, and body mass index. All statistical analyses for the study were performed using R. Software version 4.4.1.
Results: The prevalence of falls in the total participants was 3.43% (95%CI: 3.0, 3.8%). However, it was 4.0% (95%CI: 3.4, 4.6%) and 2.8% (95%CI: 2.3, 3.4%), respectively among women and men. Falls were most frequently occurred among individuals with body mass index of greater than 35 kg/m^2 (2.9% (95%CI: 2.5, 3.4)). Moreover, the frequency of falls was higher in single participants 2.8% (95%CI: 2.4, 3.3%) than in married individuals 2.3% (95%CI: 2.1, 2.6%). Rural residents had a higher frequency of falls than urban residents (2.5% (95%CI: 2.2, 2.9%) vs. 2.4% (95%CI: 2.2, 2.7%). The prevalence of falls among unemployed and employed participants was 2.8% (95%CI: 2.2, 2.6%) and 2.6% (95%CI: 2.3, 3.1%), respectively. However, all of the above prevalence rates were statistically non-significant between groups.
Conclusion: Certain demographic groups of individuals aged 50 and above exhibited a higher prevalence of falls, including females, individuals living in rural areas, those without employment, and morbid obese population. Health authorities should prioritize fall prevention strategies that focus on these high-risk segments of the population. These results highlight the importance of taking proactive steps to mitigate fall-related risk factors specific to the population aged 50 and above in Iran.
Keywords: Fall, Elderly, Iran
Conflict of Interest: All authors declare that they have no conflicts of interest.

P1526

THE CORRELATION BETWEEN POSTURAL ALIGNMENT AND MANDIBULAR DEVIATION

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O: Abnormal changes in temporomandibular joint (TMJ)-associated connective tissues can alter mandibular position and function, with muscle imbalances potentially causing mandibular lateral deviation (MLD), prompting our investigation into its correlation with global posture, related regions, and underlying causal relationships.
M: The study included 110 healthy adults aged 19–39 years, with

exclusion criteria for factors affecting mandibular stability. Posture analysis was conducted using a virtual reconstruction device (MotiPhysio Pro), and maximal mouth opening (MMO) and MLD were analyzed with Kinovea software. Measurements were taken three times, and mean values were used.
R: The most interesting result is that the more the knee flexed, the more the mandible moved to the right (ρ = 0.390, $p < 0.001$). A multiple linear regression analysis was conducted to examine whether knee flexion angles (KFA) influence MLD. The analysis showed that the regression model was significant ($F = 19.616$, $p < 0.001$), indicating its appropriateness. The adjusted R^2 was 0.146, explaining 14.6% of the variance. It was found that for each 1° increase in KFA, the MLD shifted 0.339 mm to the right. Additionally, when MLD exceeded 2 mm, the change slightly increased, with the mandible moving 0.407 mm for each degree of KFA. The adjusted R^2 for this case was 0.159, explaining 15.9% of the variance. Furthermore, a multiple regression analysis was conducted to examine whether other postural variables influence MMO. The analysis revealed that round shoulder, head posture, and the right hip-knee-ankle angle formed a valid regression equation ($F = 4.838$, $p = 0.003$). As the fascia connects the entire body, tension or issues in one area can be transmitted to another. This interconnectedness might explain why the observed impact was distributed across various tissues and joints through which the fascia passes between the TMJ and the knee. Such distribution could have diluted the overall effect, resulting in a lower observed impact.
C: This study found that KFA influences MLD and that round shoulder and other postural variables are associated with MMO. These findings may provide clinical evidence supporting the prevention and treatment of TMJ disorder through posture correction, as well as contributing to improved overall postural stability.

P1527

CORTISTATIN PREVENTS GLUCOCORTICOID-ASSOCIATED OSTEONECROSIS OF THE FEMORAL HEAD VIA THE GHSR1A/AKT PATHWAY

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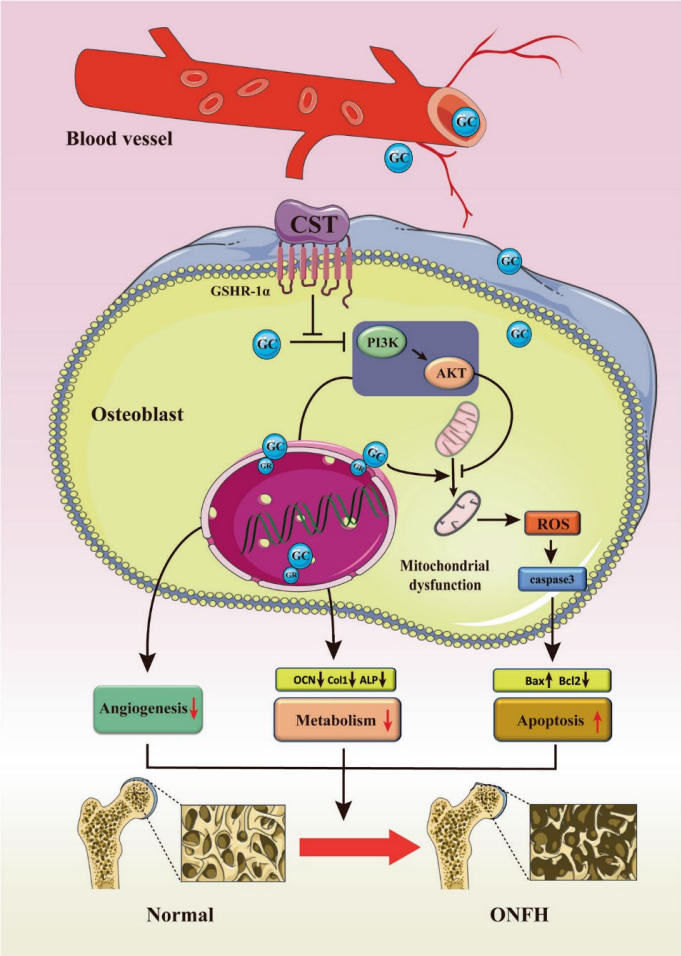
Objective: Long-term use of glucocorticoids (GCs) is known to be a predominant cause of osteonecrosis of the femoral head (ONFH). Moreover, GCs can mediate apoptosis of various cell types by exaggerating oxidative stress. The objectives of this research were to elucidate the potential function and underlying mechanisms of CST in the ONFH process.
Material and Methods: In this study, we detected that the CST expression levels were diminished in patients with ONFH compared with femoral neck fracture (FNF). In addition, a GC-induced rat ONFH model was established, which impaired bone quality in the femoral head. Then, administration of CST attenuated these ONFH phenotypes. Furthermore, osteoblast and endothelial cells were cultured and stimulated with dexamethasone (Dex) in the presence or absence of recombinant CST.
Results: Dex induced impaired anabolic metabolism of osteoblasts and suppressed tubeformation endothelial cells, while additional treatment with CST reversed this damage to the cells. Moreover, blocking GHSR1a, a well-accepted receptor of CST, or blocking the AKT signaling pathway largely abolished the protective function of CST in Dex-induced disorder of the cells.
Conclusion: We indicate that CST has the capability to prevent GC-induced apoptosis and metabolic disorder of osteoblasts in the pathogenesis of ONFH via the GHSR1a/AKT signaling pathway.



P1528

EFFICACY AND SAFETY OF COMBINATION DENOSUMAB WITH ELDECALCITOL FOR POSTMENOPAUSAL OSTEOPOROSIS: AN OPEN-LABEL, RANDOMIZED, PARALLEL-CONTROLLED TRIAL

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Objective
This study aims to compare the efficacy and safety of denosumab combined with eldecalcitol in postmenopausal osteoporosis.

Material and Methods

This open-label, randomized, positive-controlled trial was conducted at Honghui Hospital, Xi'an Jiaotong University. Eligible patients were postmenopausal women with osteoporosis (BMD T-score ≤ -2.5) or low bone mass (T-score between -2.5 and -1.0) with a fragility fracture. Participants were randomly assigned (1:1) to receive denosumab 60 mg every 6 months via subcutaneous injection for 12 months, with either oral eldecalcitol (0.75 μg daily) or vitamin D (800 IU daily) and calcium supplementation (600 mg daily). The primary outcome was the percentage change from baseline in lumbar spine BMD (L1-L4) at 12 months. Safety outcomes included adverse events and abnormal laboratory data over 12 months.

Results

Between Aug 24, 2023, and Mar 26, 2024, 112 postmenopausal women were assessed for eligibility, and 100 were randomly assigned to the eldecalcitol group (n=50) or the vitamin D group (n=50) (Figure 1). Baseline characteristics were well balanced. At baseline, all randomized participants were non-smokers and non-drinkers, and none had a history of fragility fractures. Both groups had been postmenopausal for over 10 years (11.3±6.7 vs. 11.0±7.1 years). Baseline serum 25(OH)D levels were 15.7 ng/mL and 16.8 ng/mL in the eldecalcitol and vitamin D groups, respectively. Serum calcium levels were 2.4±0.1 mmol/L in both groups. Serum phosphorus levels were both 1.2±0.1 mmol/L, serum β-CTX were both 0.6 ng/ml, and serum PINP were 64.7±18.8 ng/ml in the eldecalcitol group and 62.9±23.1 ng/ml in the vitamin D group.

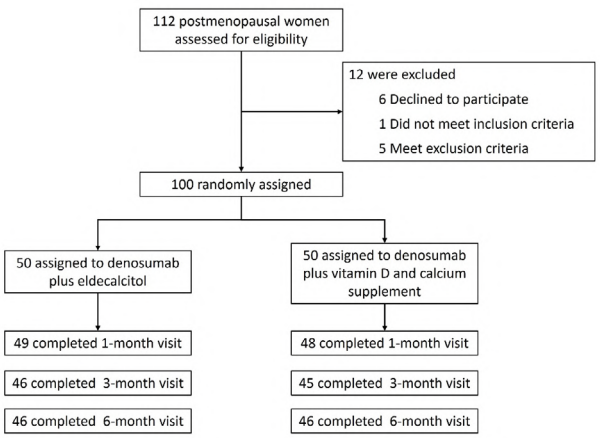
Conclusion

This trial compared denosumab combined with eldecalcitol to that with vitamin D and calcium supplements, providing insights into the treatment of postmenopausal osteoporosis.

Registration

ClinicalTrials.gov, number NCT05884372

Figure 1 Study flowchart (by 6-month visit)



P1529

INCREASED RISK OF MEDICATION-RELATED OSTEONECROSIS OF THE JAW IN RHEUMATOLOGIC PATIENTS TREATED WITH DENOSUMAB FOLLOWING INTRAVENOUS BISPHOSPHONATE THERAPY

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[Objectives]

Given the lifelong nature of rheumatic diseases, investigating the long-term safety and efficacy of osteoporosis treatments, including treatment sequences, is crucial. Denosumab offers advantages in reducing drug burden and simplifying administration, but MRONJ risk factors, especially in those switching from bisphosphonates, remain unclear. This study examines MRONJ prevalence and risk factors in rheumatic patients treated with denosumab, focusing on prior osteoporosis treatments.

[Methods]

We retrospectively reviewed 310 patients with rheumatic diseases who received denosumab therapy from 2005 to 2022 at Kyung Hee University Hospital. The cohort included rheumatoid arthritis (RA), osteoarthritis (OA), and other connective tissue diseases. Patients were categorized based on prior osteoporosis treatment. T-score changes and MRONJ incidence were assessed, and regression analysis was conducted to identify MRONJ risk factors.

[Results]

Of the patients, 64.2% were aged 65 or older, and 89.4% were female. 43.5% had no prior osteoporosis treatment, while 29.3% had used oral bisphosphonates (BP), 22.9% intravenous BP, and 4.2% selective estrogen receptor modulators (SERM). The oral BP to denosumab sequence group showed significant T-score improvement ($p < 0.0376$) (Figure1). MRONJ occurred in 9 patients (2.9%), all aged 65 or older. Six MRONJ cases were in the IV BP to denosumab group, and two in the oral BP group (Table1). Cox regression identified glucocorticoid use (OR=18.15), RA (OR=9.54), IV BP (OR=24.88), dental disease (OR=4.64), and alveolar bone surgery (OR=18.27) as significant risk factors for MRONJ (Table2).

[Conclusion]

This study underscores the need for clear guidelines on transitioning from bisphosphonates to denosumab, as increased MRONJ risk was observed in rheumatic patients following IV BP. Those with risk factors like advanced age, IV BP use, long-term glucocorticoid therapy, RA, dental conditions, or prior surgeries need careful management.

Fig 1

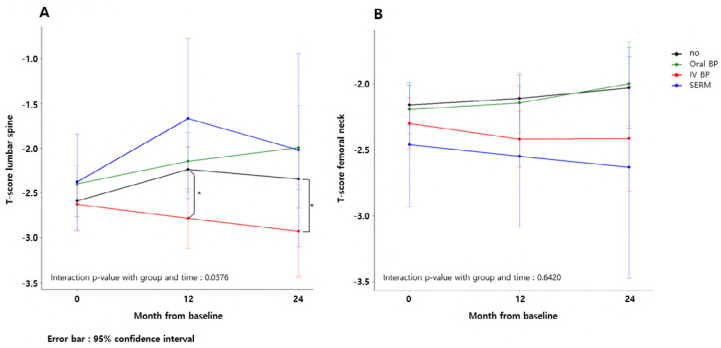

Table 1. Clinical details of patients with Medication-related Osteonecrosis of the Jaw (MRONJ) (n=9)

Patient no.	병록번호	Age	Gender	Disease status	Use of csDMARDs	Causative events	Previous Therapy	Duration of glucocorticoid (year)	Duration of BP therapy (year)	Drug holiday (month)	CTX-mean percentage chage from baseline	Osteocalcin levels at the time of ONJ diagnosis (5-25ng/ml)
1	11887086	79	Female	RA	MTX, leflunomide	Periapical abscess	Oral BP	12	4	3	18.8% decrease	1.16
2	11161796	79	Female	RA	MTX	Dental extraction	Oral BP	8	5	3	22.3% decrease	2.13
3	11924392	85	Female	RA	MTX, leflunomide	Implant-related disease	IV BP	6	3	0	17.9% decrease	2.73
4	11653562	85	Female	RA	MTX, HCQ	Periapical abscess	IV BP	6	3	1	25.3% decrease	2.90
5	10985241	77	Female	RA	MTX, leflunomide	Periapical abscess	IV BP	17	7	6	11.3% increase	1.89
6	10405680	73	Female	PMR	-	Implant-related disease	IV BP	7	3	4	37.2% decrease	1.14
7	17077945	73	Female	RA	MTX, HCQ	Dental extraction	IV BP	4	1	3	11.1% increase	2.60
8	11845505	71	Female	RA	MTX, leflunomide	Old denture	IV BP	9	6	0	10.5% decrease	0.98
9	12689891	86	Male	RA	MTX, tacrolimus	Old denture	none	2	-	-	62.6% decrease	4.28

Table 2 Univariate and multiple Firth's penalized logistic regression analyses of risk factors for medication-associated osteonecrosis of jaw (MRONJ)

Risk factors	Univariate analysis		Multiple analysis*	
	OR (95% CI)	*P* -value	OR (95% CI)	*P* -value
Age (≥65)	1.11(1.04-1.20)	0.004	adj.	-
Female sex	0.68(0.11-4.12)	0.678	adj.	-
Menopausal	0.83(0.14-4.95)	0.836	adj.	-
Smoking	2.42(0.39-15.10)	0.343	adj.	-
BMI (≥20)	0.77(0.18-3.33)	0.724	adj.	-
Duration of medication	1.01(0.95-1.08)	0.738	1.00(0.94-1.07)	1.000
Treatment with glucocorticoids	13.7(0.78-240.14)	0.073	18.15(1.31-252.54)	0.031
Duration of glucocorticoids use	1.02(1.01-1.02)	0.001	1.02(1.01-1.03)	0.001
Co-morbidity factors				
Hypertension	4.93(0.85-28.55)	0.075	2.63(0.50-13.84)	0.253
Diabetes	0.58(0.10-3.39)	0.545	0.36(0.06-2.05)	0.252
Liver disease	0.81(0.04-15.53)	0.887	1.11(0.06-19.83)	0.943
Cardiovascular disease	4.83(1.05-22.32)	0.044	1.70(0.32-9.12)	0.536
Cerebral infarction	1.62(0.08-34.79)	0.757	4.11(0.18-91.40)	0.373
Chronic kidney disease	0.69(0.04-13.02)	0.802	0.14(0.01-3.14)	0.216
Cancer	1.22(0.06-24.79)	0.897	1.99(0.1-40.27)	0.655
GERD	0.91(0.05-17.78)	0.951	0.69(0.03-19.30)	0.826
Disease status				
Rheumatoid arthritis	9.02(1.56-52.25)	0.014	9.54(1.91-47.72)	0.006
psoriatic arthritis	4.49(0.14-146.01)	0.398	1.02(0.02-44.21)	0.994
Osteoarthritis	0.11(0.01-1.86)	0.124	0.06(0.00-0.93)	0.044
Systemic Lupus Erythematosus	0.72(0.04-13.76)	0.829	0.94(0.05-18.31)	0.968
Ankylosing spondylitis	2.84(0.11-72.22)	0.528	17.15(0.51-574.02)	0.113
Behcet's disease	1.13(0.06-22.59)	0.939	1.84(0.10-34.43)	0.683
Polymyositis/Dermatomyositis	1.62(0.08-34.79)	0.757	3.60(0.16-83.14)	0.425
Systemic Sclerosis	1.82(0.08-40.08)	0.705	3.45(0.13-93.14)	0.462
Gout	3.48(0.13-97.21)	0.463	2.32(0.07-72.88)	0.632
Polymyalgia rheumatica	9.51(1.21-75.11)	0.033	7.77(0.92-65.62)	0.050
Sjogren's syndrome	1.46(0.07-30.70)	0.807	1.18(0.05-29.71)	0.922
ANCA associated vasculitis	2.39(0.10-57.17)	0.590	1.67(0.07-41.64)	0.756
Prior osteoporosis treatment				
Oral BP	2.51(0.32-19.47)	0.380	5.13(0.55-47.74)	0.151
IV BP	8.90(1.46-54.24)	0.018	24.88(2.49-248.76)	0.006
SERM	3.32(0.12-94.19)	0.482	4.08(0.10-171.76)	0.461
Dental comorbidities				
Pre-existing dental or periodontal disease	61.10(3.05-int)	0.007	4.64(4.52-4.76)	<0.001
Denture pressure	367.86(13.57- int)	<0.001	.	.
Implant-related disease	858.48(22.72- int)	<0.001	.	.
Dentoalveolar surgery	111.96(4.94- int)	0.003	18.27(17.77-18.79)	<0.001

The data are presented as no. (%) of patients or median (interquartile range), unless otherwise indicated.

P1530

IMPROVING FRACTURE RISK PREDICTION WITH A DEEP LEARNING CHEST RADIOGRAPHY MODEL COMBINED WITH FRAX

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Objective

FRAX is a widely used tool for predicting fracture risk but is limited by its reliance on dual-energy X-ray absorptiometry (DXA) and inability to assess short-term fracture risk. This study aimed to develop a deep learning (DL)-based model using chest radiography (CXR) and combine it with FRAX to enhance predictive performance.

Materials and Methods

This multicenter study included 42,014 patients from Institution A (2008–2019) for DL model development and 10,523 patients from Institution B (2003–2022) for external test. CXRs were preprocessed using localized energy-based normalization, and convolutional neural network-based DL models were trained separately for original and normalized images. Ensemble outputs of DL and FRAX (DL-FRAX) were used for final predictions. A logistic hazard loss function was employed to directly estimate survival functions. Performance was assessed using C-index and area under the receiver-operator curves (AUROCs) in internal (5,000 cases) and external (10,523 cases) test sets, comparing DL, DL-FRAX, and FRAX.

Results

Mean ages were 59.3, 61.4 years, and 79.8%, 67.9% were female in development and external test sets, respectively. In predicting major osteoporotic fractures, the DL model achieved a C-index of 0.867 and 2-, 3-, and 5-year AUROCs of 0.878, 0.887, and 0.886, outperforming FRAX (C-index: 0.800; AUROCs: 0.805, 0.804, and 0.805, all $P<0.001$) in the internal test set. The DL-FRAX ensemble model showed a C-index of 0.847 and AUROCs of 0.858, 0.873, and 0.868, which were also significantly higher than the performances of FRAX model (all $P<0.001$). Similarly, in the external validation set, C-index values were 0.763 and 0.752 for DL and DL-FRAX models, respectively, which showed significantly higher performances than that of FRAX (C-index of 0.737, both $P<0.001$). In terms of vertebral, nonvertebral, and hip fractures, DL model's performances showed C-indices of 0.871, 0.852, and 0.923, respectively. Corresponding 2-, 3-, and 5-year AUROCs were 0.873, 0.886, and 0.888 for vertebral; 0.934, 0.907, and 0.874 for non-vertebral; and 0.931, 0.928, and 0.936 for hip fractures.

Conclusion

Combining a DL-based model using CXR with FRAX significantly improved fracture risk prediction compared to FRAX alone. This approach may provide a more accessible, effective tool for clinical fracture risk assessment.

P1531

ISORHYNCHOPHYLLINE MITIGATES BONE LOSS IN OVX MICE BY MODULATING INFLAMMATORY RESPONSES, OXIDATIVE STRESS, GUT MICROBIOTA COMPOSITION AND SCFA PRODUCTION

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Background: Osteoporosis (OP) is a systemic skeletal disorder characterized by reduced bone mass and deteriorated bone architecture, leading to an increased fracture risk. Isorhynchophylline (IRN), an active alkaloid derived from *Uncaria rhynchophylla*, is known for its significant anti-inflammatory and antioxidant properties. However, its potential role in mitigating bone loss has not been thoroughly investigated. This study examines the protective

effects of IRN against bone loss in ovariectomized (OVX) mice, with a focus on its regulation of inflammatory responses, oxidative stress, gut microbiota composition, and the production of short-chain fatty acids (SCFAs).
Methods: The potential core targets and mechanisms of action of IRN in the treatment of OP were investigated through network pharmacology and molecular docking, following by in vivo validation on OVX mice treated with 8-week IRN. The study included Micro-CT analysis to assess bone microstructure, measurement of serum biomarkers for inflammation and oxidative stress, immunohistochemical analysis of tight junction proteins, SCFAs quantification, and gut microbiome profiling via 16S rRNA sequencing.
Results: Network pharmacology analysis identified 50 intersecting targets between IRN and OP, with molecular docking demonstrating strong binding affinities of IRN to EGFR and GSK3B. GO and KEGG enrichment analyses revealed that IRN is involved in many key pathways related to cell survival, inflammation, and oxidative stress, with the PI3K-Akt signaling pathway being notably prominent. *In vivo* assessment showed that IRN treatment reduced serum levels of the pro-inflammatory cytokines, such as tumor necrosis factor-alpha (TNF-α), interleukin-1 beta (IL-1β) and interleukin-6 (IL-6), while increasing serum levels of the anti-inflammatory cytokine interleukin-10 (IL-10) in OVX mice and reversed the excessive bone loss caused by estrogen deficiency. IRN also effectively managed the oxidative stress in OVX model, characterized by lowered serum levels of nitric oxide (NO), inducible nitric oxide synthase (iNOS) and reactive oxygen species (ROS). Immunohistochemical analysis indicate that IRN repaired the compromised intestinal barrier in OVX mice by upregulating the expression of tight junction proteins, including Zonula Occludens-1(ZO-1), Claudin-1 and Occludin. Additionally, IRN modulated the gut microbiota composition, reducing the abundance of *Helicobacter* and increasing the level of butanoic acid, a type of SCFAs.
Conclusions: IRN effectively alleviates OVX-induced bone loss through its anti-inflammatory and antioxidant properties, modulation of gut microbiota composition, and enhancement of short-chain fatty acid (SCFA) production.
Keywords: Isorhynchophylline, Ovariectomizedmice, Osteoporosis, Gut microbiota, SCFAs, Anti-inflammatory, Antioxidant.

P1532

ASSESSMENT OF BONE HEALTH AND BISPHOSPHONATE TREATMENT IN GIRLS WITH RETT SYNDROME: RESULTS FROM A NATIONAL CENTER

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Background: A common non-neurological morbidity of Rett syndrome (RTT) is impaired bone health and increased fracture risk. Our aim was to assess lumbar bone mineral density (BMD) and trabecular bone score (TBS) of girls with RTT and evaluate the efficacy bisphosphonates treatment.
Methods: This retrospective study included 40 females with RTT aged 5-22 years who performed dual energy x-ray absorptiometry (DXA) scan between 2019-2024 at a national center for RTT. Data retrieved included: medical treatment, anthropometric measurements, mobility score (GMFCS), blood test results and fracture history.
Results: The median age at the first DXA scan was 10.8 years. Mean L1-4 BMD Z-score was -2.1±1.4, and mean TBS Z-score was -0.4±1.3. L1-4 BMD Z-score showed significant correlations with height Z-score (r=0.407, p=0.009), weight Z-score (r=0.551, p<0.001), and BMI Z-score (r=0.644, p<0.001). TBS Z-score was correlated with height Z-score (r=0.753, p<0.001), weight Z-score (r=0.652, p=0.003), and with L1-4 BMD Z-score (r=0.594, p=0.009). poor L1-4 BMD Z-score was associated with poor mobility score (p=0.05), and valproic acid treatment (p=0.016). Nine girls (23%) were treated with zoledronate. The mean age at zoledronate initiation was 9.7±2.3 years (range 6.5-12.3 years), and the mean duration of treatment was 2.0±0.5 years. Four of them completed two DXA scans (prior to the initiation of zoledronate treatment, and 2.0 ± 0.2 after treatment). The mean L1-L4 BMD Z-score was -2.2 ± 0.9 at the first scan and -1.4 ± 0.9 at the second scan
Conclusions: Girls with Rett syndrome (RTT) demonstrated reduced lumbar BMD, which was significantly correlated with anthropometric parameters, TBS, mobility, and valproate treatment. Zoledronate treatment may be considered in selected cases.

P1533

RECOMBINANT HUMAN BONE MORPHOGENETIC PROTEIN ENHANCES FRACTURE HEALING AND BONE REGENERATION IN CEMENT PERFUSION BLIND ZONES: A PROSPECTIVE COHORT STUDY OF OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURES

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BACKGROUND CONTEXT: Vertebroplasty alleviates pain, restores vertebral height, and enhances spinal stability through the injection of polymethylmethacrylate (PMMA). However, in cases of severe osteoporosis and extensive trabecular destruction within the fractured vertebra, the distribution of PMMA may become uneven, resulting in perfusion blind spots. These blind spots can increase the risk of delayed or poor vertebral fracture healing. At present, research on PMMA perfusion blind spots remains limited, with a notable lack of clinical evidence from comparative prospective studies.
PURPOSE: This study aims to test the hypothesis that recombinant human bone morphogenetic protein (rh-BMP) combined

with bone cement augmentation in osteoporotic vertebral compression fractures can enhance bone repair in the blind areas of bone cement perfusion and significantly promote fracture healing at the 3-month postoperative follow-up. Additionally, it seeks to report and compare radiographic outcomes and patient-reported clinical improvements at the 12-month postoperative follow-up.
DESIGN: Prospective, Single-center, observational cohort study.
PATIENT SAMPLE: Patients with osteoporotic vertebral compression fractures undergoing 1 or 2-level percutaneous vertebroplasty.
OUTCOME MEASURES: Eligible patients were consecutively recruited from outpatient clinics and emergency departments. Vertebroplasty was performed based on clinical judgment by surgeons with extensive experience in the procedure, with rh-BMP implanted in the experimental group. Baseline characteristics, surgery-related factors, and laboratory test results were collected and analyzed to assess potential baseline differences between the two groups. Repeated measures ANOVA was conducted to compare changes in CT values of the non-perfused areas in the surgical segments between the groups. Independent sample t-tests were used to evaluate changes in CT values of the non-perfused areas at various postoperative time points. Additionally, propensity scores were introduced as covariates, and an additional analysis of covariance (ANCOVA) was performed to validate the reliability and robustness of the initial intergroup comparison results.
RESULTS: Patients who underwent vertebroplasty with rh-BMP implantation (n=48) compared to those who underwent standard vertebroplasty (n=50) were similar in age (71.4±21.6 vs 68.1±19.9 years, p=0.433), gender distribution (female: 70.8% vs 72.0%, p=0.898), BMI (23.6±3.41 vs 22.9±4.07, p=0.359), and smoking status (35.4% vs 40.0%, p=0.640). There were no statistically significant differences between the groups in baseline pain scores, fracture severity, or duration of symptoms prior to treatment. At 1-month follow-up, patients in the rh-BMP group demonstrated greater improvement in pain scores compared to the control group (VAS: 4.3±1.2 vs 3.5±0.6, p<0.001), and a higher rate of radiographic evidence of fracture healing in 3-month follow-up (98.3% vs 88.3%, p=0.028). By 12-month follow-up, the rh-BMP group continued to show superior outcomes in bone density CT value improving rates (47.1±18.6 vs 15.8±5.2, p<0.001) and structural stability (96.7% vs 85.0%, p=0.007), while no clinically meaningful differences were observed between the groups in functional disability scores (ODI: 21.4±9.6 vs 22.1±8.7, p=0.706) or quality of life measures. No significant differences in complication rates were noted between the two groups.
CONCLUSIONS: Patients with osteoporotic vertebral compression fractures who underwent vertebroplasty augmented with rh-BMP exhibited statistically significant and clinically meaningful improvements in fracture healing and pain alleviation during the follow-up period. Notably, rh-BMP demonstrated a unique ability to enhance bone regeneration in areas beyond the direct reach of bone cement, effectively improving bone quality in the cement perfusion blind zones. This property contributed to enhanced osteogenesis and improved structural stability, underscoring the potential of rh-BMP as a valuable adjunctive strategy for promoting fracture repair and functional recovery in patients with osteoporosis.

P1534

TARAXASTEROL AMELIORATES OVX MICE BONE LOSS BY SUPPRESSINGNLRP3 INFLAMMASOME AND MODULATING GUT MICROBIOTA

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Aims: Postmenopausal osteoporosis (PMOP) is a prevalent skeletal disorder associated with menopause-related estrogen withdrawal. Taraxasterol (Tara), a pentacyclic-triterpene isolated from Taraxacum officinale, has been shown to have anti-inflammatory and anti-rheumatic effects. However, its efficacy against PMOP remains unclear. The purpose of this research is to investigate Tara's anti-osteoporotic effects.
Main methods: In this study, the ovariectomized (OVX) mouse model is a well-established surrogate for PMOP, recapitulating the bone loss observed in humans following menopause. After 8 weeks of intervention, the mice were euthanized, and samples from their femur, serum, colon and feces were collected, then bone microstructure parameter, NLRP3 inflammasome, inflammatory cytokines, intestinal barrier and gut microbiota (GM) were assessed. Network pharmacology and molecular docking approach to predict and validate its anti-osteoporosis-related molecular targets and pathways.
Key findings: The results revealed that Tara lowered proinflammatory cytokine levels (IL-6, TNF-α), suppressing NLRP3 inflammasome (caspase-1, IL-1β and IL-18) and affected adipokines content (decrease leptin and visfatin, increases adiponectin), which enhances bone strength and prevents OVX-induced bone loss. Moreover, it restored the abundance of GM and increased the expression of Occludin and ZO-1 protein in the colon. Network pharmacology identified a total of 75 core anti-osteoporosis targets. Of these, ALB, PPARG, IGF1, EGFR, ESR1, CASP3, HSP90AA1, SRC, GSK3B, MMP2 were successfully docked with the Tara and showed excellent binding ability.
Significance: The present study suggests that Tara alleviated inflammatory cytokines, NLRP3 inflammasome andintervened GM, representing Tara is a novel, promising therapeutic candidate for PMOP.
Keywords: Taraxasterol; Osteoporosis; NLRP3 inflammasome; Gut microbiota
P

1535

THE PERCEPTION AND CHALLENGES OF PRACTITIONERS IN THE MANAGEMENT OF PATIENTS WITH PRIMARY SJÖGREN'S SYNDROME

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Objectives

Sjögren's Syndrome (SSj) is a systemic disease whose management is sometimes critical and requires various healthcare practitioners' collaboration [1].

Our study aimed to assess the perception of practitioners when dealing with a patient with SSj.

Material and Methods

We conducted a cross-sectional study involving physicians treating SSj patients. They were invited to answer a self-administered questionnaire via Google Forms. The questions included sociodemographic data, data related to the doctors' perception of patients with SSj as well as their confidence in the management of the disease using a Likert scale. We identified factors associated with an overall better perception. The level of significance was fixed at p≤0.05.

Results

Our study included 96 practitioners with a male-to-female ratio of 0.2. The participants were rheumatologists (38%), internists (20%), nephrologists (10%), family physicians (23%), ophthalmologists (6%), pulmonologists (1%), anesthetists (1%) and physical medicine specialists (1%). The average age of the participants was 30.9 years [25-60], and the average years of practice were 4.95 [1-58]. The mean number of SSj patients per monthly consultation was less than 5 (65%), between 5 and 10 (27%) and more than 10 (8%). During the consultation, half of the physicians (50%) were indifferent; others felt empathy (37%), anxiety (8%), and annoyance (5%). More importantly, 69% of the respondents felt apprehensive during consultations, due to disease manifestations (43%), the risk of degeneration (41%), the limited therapeutic arsenal (57%), the lack of effectiveness of treatments in certain manifestations (54%), and a lack of knowledge about the pathology (1%). Sixty-three percent of the doctors believed that patients would be more complainant compared to other chronic inflammatory rheumatic diseases. This complaint was justified in 87% of the cases and attributed to: various clinical manifestations of the disease (62%), the risk of lymphomatous transformation (10%), fibromyalgia (21%), dry syndrome (21%), anxiety (1%), and the lack of improvement (1%). About 42% of the respondents were not confident and satisfied with managing SSj patients. This was attributed to the limited treatments in most of the cases (96%). Proposed solutions included encouraging medical research (48%), optimizing consultation time (10%), establishing a SSj calendar with patient-recorded complaints to discuss during consultations (15%), and improving access to care (1%). There was no association between physicians' satisfaction and their specialty (p=0.869) nor the years of practice (p=0.19). However, the degree of satisfaction in the management of SSj was significantly lower in practitioners who expressed apprehension (p=0.031).

Conclusion

This study highlighted the challenges faced by practitioners when managing patients with SSj. The limited therapeutic options were the most frequently reported cause. This underscores the importance of promoting research to ensure optimal care for these patients.

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P1536

INTEREST OF THE NEUTROPHIL/LYMPHOCYTE RATIO (NLR) AND PLATELET/LYMPHOCYTE RATIO (PLR) IN PRIMARY SJÖGREN'S SYNDROME: RELATIONS WITH CLINICAL AND BIOLOGICAL MANIFESTATIONS

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Objectives Primary Sjögren's syndrome (pSS) is a chronic autoimmune disease characterized by both glandular and extra-glandular involvement. Its activity is assessed using established clinical and biological scores [1]. Inflammatory markers such as the NLR (neutrophil/lymphocyte ratio) and PLR (platelet/lymphocyte ratio) have been associated with the activity of other chronic inflammatory rheumatic diseases, such as rheumatoid arthritis [2].

This study aimed to explore the associations between these markers and the clinical, biological, and immunological features of primary Sjögren's syndrome.

Material and methods We conducted a cross-sectional study that included female patients followed for pSS. Clinical, biological, immunological, and therapeutic data were recorded. Disease activity was assessed using the ESSDAI score. The NLR and PLR were calculated for all patients. An association between these ratios and clinical and biological parameters, as well as disease activity, was sought. A significance threshold was set at p<0.05.

Results Our study included 31 women. The mean age of the patients was 57.8 years [32-75], and the mean age at diagnosis was 52.9 years [32-70]. The average duration of disease was 11.3 years [1-32]. The distribution of manifestations was as follows: joint involvement (87.1%), pulmonary involvement (22.6%), renal involvement (3.2%), hematological involvement (12.9%), neurological involvement (16.1%), xerophthalmia (93.5%), and xerostomia (54.8%). The mean ESSDAI score was 5.3±5.1 [0-17]. The mean ESSPRI score was 5.9±1.9 [1-8.3]. The mean ESR and CRP levels were 39.4±27.6 [5-100] and 8.3±13.8 [0-5.59], respectively. The mean NLR was 1.9±1 [0.7-5.1]. The mean PLR was 149.4±77.5

[58.2-400]. A statistically significant association was found between NLR and renal involvement (p=0.026) and mean corpuscular volume (MCV) (p=0.051). Similarly, PLR was significantly associated with disease duration (p=0.051), joint involvement (p=0.001), CRP (p=0.018), and the positivity of anti-SSB antibodies (p=0.055). However, there was no association between PLR and ESSDAI (p=0.734) nor between NLR and ESSDAI (p=0.978).

Conclusion Our study showed that PLR is significantly associated with disease duration and CRP, while NLR is mainly related to renal involvement and MCV. These results suggest that PLR may be useful for monitoring pSS, although NLR is not a reliable indicator of the overall activity of the disease or its other manifestations. Further studies are needed to refine these associations.

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P1537

ASSESSMENT OF OSTEOPOROSIS KNOWLEDGE AMONG NURSES: GAPS AND INFLUENCING FACTORS

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Objective

Osteoporosis (OP) is a common skeletal disorder characterized by reduced bone mineral density, leading to an increased risk of fractures. Nurses, as one of the primary healthcare providers, play a critical role in the detection, prevention, and management of osteoporosis. However, despite their vital contribution, limited research has explored nurses' knowledge and understanding of osteoporosis.

The objective of this study was to assess nurses' knowledge of OP and factors associated with better awareness.

Material and methods

We conducted a cross-sectional survey involving nurses from various specialties, across three healthcare settings. Data were collected using a self-administered questionnaire developed through Google Forms. The survey included the Osteoporosis Knowledge Assessment Test (OKAT), a validated tool to evaluate osteoporosis-related knowledge [1]. The questionnaire consisted of 20 questions addressing key topics such as risk factors, diagnostic methods, prevention strategies, and treatment options. OKAT scores ranged from 0 to 20, with knowledge levels categorized as follows: scores of 0–7 indicated poor knowledge, 8–13 indicated good knowledge, and scores of 14 or higher indicated excellent knowledge.

Results:

The study included 50 participants, with a female predominance (sex ratio M/F=0.35).

The mean age of the participants was 33 (9) years [24-60]. The mean duration of practice was 8 (8) years [1-42]. Regarding workplace distribution, 71% of participants worked in medical specialties, while 29% were in surgical specialties. Additionally, 96% of participants worked in urban healthcare settings, with only 4% based in rural areas. Most participants (92%) were employed in public institutions, while only 8% worked in private settings. In terms of prior training, 26% of participants reported having received education on osteoporosis. The mean OKAT score was 10(3) [0–16]. Based on the scoring categories, 18% of participants demonstrated poor knowledge, 76% exhibited good knowledge, and 6% achieved excellent knowledge. Among the OKAT questions, Question 1 (focusing on fracture risk) had the highest percentage of correct answers (94%), whereas Question 18 (addressing the statement: "There is a small amount of bone loss during the ten years following the onset of menopause") had the lowest percentage of correct responses (14%). OKAT scores were significantly higher among females and participants with prior training on osteoporosis (p=0.025 and p=0.003 respectively). Participants from medical specialties scored significantly better on risk factor-related questions compared to those in surgical specialties (P=0.014).

Additionally, Participants with more years of clinical experience demonstrated significantly better responses to prevention-related questions, suggesting that professional experience contributes to a stronger understanding of prevention strategies (P=0.04).

Conclusion:

Our study revealed low to good levels of OP knowledge among nurses, highlighting the need for targeted education to raise osteoporosis awareness among healthcare providers, and improve patient outcomes.

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P1538

OSTEOPOROSIS IN RHEUMATOID ARTHRITIS PATIENTS: FACTORS INFLUENCING ADHERENCE TO BISPHOSPHONATE THERAPY

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Objectives

Osteoporosis (OP) represents a significant socio-economic burden due to its most severe complication, fractures, which are particularly prevalent in cases of poor treatment adherence [1]. While most studies on bisphosphonate (BP) compliance have

focused on postmenopausal osteoporosis, limited attention has been given to patients with rheumatoid arthritis (RA), a population at heightened risk for both OP and fractures [1].
The aim of this study was to assess the frequency of BP use in OP patients with RA and identify factors associated with poor adherence to treatment.

Material and methods:

This cross-sectional study, included patients diagnosed with RA according to the ACR/EULAR 2010 criteria and osteoporosis, recruited from the rheumatology department of Mongi Slim Hospital, La marsa [1]. Sociodemographic data, comorbidities, disease-related characteristics as well as data related to OP management were collected. Bone mineral density (BMD) was assessed using dual-energy X-ray absorptiometry (DXA) at the lumbar spine and femoral neck. Good compliance with BP treatment was defined as a renewal of treatment for a minimum of 3 years.

Results :

The study included 54 women with RA, of whom 94.4% were postmenopausal. The mean age was 62 ± 11 years, and the mean disease duration was 111 ± 109 months. More than half of the patients (55.6%) were illiterate, and 72.2% were covered by the national health insurance fund. Comorbidities included arterial hypertension (42.6%), diabetes (25.9%), and dyslipidemia (5.6%). The mean body mass index (BMI) was 25±5 kg/m² [13.2-36.8], with 14% categorized as lean. Disease activity was high in over 50% of participants, with a mean DAS28ESR score of 5 ± 1.4. The mean BMD at the vertebral and femoral sites was -2.8±0.9 SD [-4.4; -0.2] and -2.9±0.7 SD [-4.8; -1.5] respectively. Calcium supplementation was prescribed in 83.3% of cases, at an average dose of 550±255 mg/d, and Vitamin D in 90.7% of cases at an average dose of 932±351 IU/d. A history of fracture was noted in 22.2% of cases, with 9.3% experiencing femoral fractures, 9.3% vertebral fractures, and 3.7% wrist fractures. BP intake was noted in 31.5% of patients, with the majority (81.8%) using the oral route. The average duration of BP treatment was 3.2±1.1 years [1-5] with over 88% having good compliance. There was a significant association between good BP compliance and social security coverage (p=0.008), as well as high disease activity (p=0.03). There was no statistically significant association between good adherence to BP and age (p=0.28), level of education (p=0.8), geographical origin (p=0.77), length of RA (p=0.44) or history of fracture (p=0.07).

Conclusion :

Our study highlighted the suboptimal prescription of BP among osteoporotic RA patients in real-life practice, which limits the overall effectiveness of osteoporosis management. Over 88% of patients demonstrated good compliance with treatment. Social security coverage and high disease activity were identified as significant factors associated with adherence.

P1539

IMPACT OF ORAL HYGIENE ON THE WELL-BEING OF PATIENTS WITH RHEUMATOID ARTHRITIS

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Objectives

Patients with rheumatoid arthritis (RA) suffer more frequently from periodontitis than the rest of the population [1]. Although this causal relationship has been demonstrated, few studies have assessed the impact of oral hygiene on RA patients
The objective of this study was to assess the impact of dental abnormalities on the quality of life and disease activity of patients with RA.

Material and methods

We conducted a cross-sectional study that included patients with RA recruited from the rheumatology department of Mongi Slim Hospital. Sociodemographic data as well as those related to RA were transcribed. All patients underwent an oral examination and a dental panoramic. The impact of oral conditions on the patients' well-being and their quality of life was measured using the Oral Health Impact Profile-14 (OHIP-14) scale [2]. The questionnaire covers 7 areas: functional limitations, physical pain, psychological discomfort, physical disability, psychological disability, social disability and disability. The total score ranges from 1 to 7, where a high score reflects a significant discomfort. We investigated the profile of RA associated with a poorer oral health. The significance threshold was set at $p<0.05$.

Results

In total, 50 patients were included. The mean age was 56 (10) years [30-75 years]. There was a female predominance (sex ratio 8:1). The mean disease duration was 9 (6) years [1-23]. RA was immunopositive and erosive in the majority of cases (92% and 82%, respectively). Regarding treatment modalities, the prescription was as follows: Methotrexate (76%), Salazopyrine (14%), Leflunomide (12%), b-DMARDs (24), and ts-DMARDs (6%). The mean erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) were 48 (30) mm [3-107] and 25 (30) mg/L [1-119], respectively. The mean Disease Activity Score (DAS28-ESR) was 4.3 (1.53) [2.02-7.9] with the majority of the patients having a moderate activity (44%).The dental examination was abnormal in most cases (82%). The most common abnormalities were carious lesions (78%), dental abscesses (26%) and periodontitis (8%). About 36% of the patients had more than one abnormality. The mean OHIP-14 score was 0.6 [0-1.6]. Among the subscores obtained for the different domains, the highest was for physical pain (0.2). There was no significant association between oral hygiene and the number of painful joints (p=0.3), swollen joints (p=0.567), ESR (p=0.59), CRP (p=0.505), and DAS28 ESR (p=0.6). However, younger RA patients with oral abnormalities had a better quality of life according to the OHIP-14 (p=0.026).

Conclusion

Our study emphasizes the high prevalence of oral involvement in

RA. The main factors associated with a poorer well-being were age particularly in the domain of physical pain. This highlights the need for a better screening and targeting of these abnormalities as part of a holistic approach.

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P1540

PARITY AND LOW HAND GRIP STRENGTH IN POSTMENOPAUSAL WOMEN

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Objective: Given the high prevalence of sarcopenia among postmenopausal women, identifying predictive parameters is crucial. Since hand grip strength (HGS) is one of key parameter in diagnosing sarcopenia and parity affects estrogen exposure, this study aims to examine the association between parity and HGS. Material and Methods: Data from the Korean National Health and Nutrition Examination Survey (KNHANES) from 2014 to 2019 were analyzed and 4,102 postmenopausal women aged 45-65 years were involved. Participants were categorized into two groups: HGS<18kg and HGS≥18kg. Logistic regression analysis was used to assess the association between parity and HGS. Results: Among participants, 17.8% had HGS<18kg, indicating possible sarcopenia. Mean HGS were 20.33kg for nulliparous women, 21.65kg for primiparous women, and 21.88kg for those with three or more parities (p<0.001). The risk of low HGS increased by 5% with age (OR: 1.05, p<0.001), and decreased by 6% with each year increase in age at menopause (OR:0.94, p<0.001). Women with parities had a lower risk of low HGS compared to nulliparous women (OR=0.52, p=0.004). Among women with parities, those with more than two births had reduced risk of low HGS (OR=0.68, p=0.021). Conclusion: Increased parity is significantly associated with higher mean grip strength. In postmenopausal women, multiparity is linked to a reduced risk of “possible sarcopenia". Advanced age, early menopause, and dyslipidemia also contribute to low HGS in this population.

P1541

FREQUENCY OF PROPABLE SARCOPENIA IN PATIENTS AGED 60 AND OLDER WITH KNEE OSTEOARTHRITHIS AND ITS ASSOCIATION WITH GERIATRIC SYNDROMES

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Objective: To evaluate the frequency of probable sarcopenia in patients with knee osteoarthritis after 60 years of age and to identify the relationship with geriatric syndromes by comprehensive geriatric assessment.

Methods: Cross-sectional, single-center study was included 46 patients (median age 77 [70;81]) with confirmed knee osteoarthritis according to the 2019 ACR criteria. Sarcopenia was diagnosed according to the criteria European Working Group on Sarcopenia (EWGSOP2). Skeletal muscle strength was determined by grip strength using a dynamometer. Low muscle strength was defined as values less < 16 kg for women and < 26 kg for men. Low physical performance was defined as a decrease in the total score Short physical performance battery (SPPB) < 9 points. Geriatric assessment included: screening of frailty using «Age is not a blocking» questionnaire, Mini Nutritional Assessment, orthostatic test, Barthel Index for Activities of Daily Living, Lawton Instrumental Activities of Daily Living Scale, fracture risk assessment tool, Visual Analog Scale, Geriatric Depression Scale-15, The Mini Mental State Examination. Physical activity was assessed using International Physical Activity Questionnaire, comorbidity by Charlson Comorbidity Index.

Results of the study: probable sarcopenia was diagnosed among 28,3% of patients with knee osteoarthritis, 69,2% were women and 30,9% men. There were no differences in education level, residential status, disability group and number of chronic comorbidities between sarcopenic patients and non-sarcopenic patients. Patients aged 60-74 years and women were more in both groups (p>0.05). Sarcopenic patients were more likely to have orthostatic hypotension (p=0.027), urinary incontinence (p=0.030), low physical activity (p=0.03) and had a higher need for personal care (p= 0.075) than non-sarcopenic patients. Chronic pain syndrome by VAS 40 mm and more, falls and high fracture risk occurred in patients with similar frequency in both groups. Moderate and severe comorbidity did not differ between sarcopenic and non-sarcopenic patients (p>0.05).

Conclusion: geriatric syndromes like orthostatic hypotension, urinary incontinence, and low physical activity were more frequent in sarcopenic patients with knee osteoarthritis. Patients with probable sarcopenia were more in need of personal care and a complex of physical exercises.

P1542

FREQUENCY AND RELATIONSHIP OF SARCOPENIA WITH LATE DEBUT OF RHEUMATOID ARTHRITIS IN ELDERLY PATIENTS

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Objective: to evaluate the frequency of sarcopenia in patients with rheumatoid arthritis (RA) with the onset of the disease at the age of 60 years and older and to identify the relationship with demographic indicators and disease activity.
Methods: The study included 46 patients (mean age 71.8±6.5 years) with confirmed RA corresponding to the 2010 ACR/EULAR classification criteria. RA activity was assessed by the DAS28. Sarcopenia was diagnosed according to the criteria European Working Group on Sarcopenia (EWGSOP2). Low muscle strength was defined as values less < 16 kg for women and < 26 kg for men. Skeletal muscle mass was calculated by Appendicular skeletal muscle mass (ASMM) by Dual-energy X-ray absorptiometry (DXA). Low muscle mass was defined as values less < 5.5 kg in women and < 7 kg in men. Low physical performance was defined as a decrease in the total score Short physical performance battery (SPPB) <9 points.
Results of the study: Sarcopenia was detected in 18% of patients with late onset RA (75% of women and 25% of men). There were no differences in the mean values of muscle strength (p = 0.09) and muscle mass (p=0.3) in this groups. However, gender differences in the components of sarcopenia have been revealed. Thus, women aged 60-74 years muscle strength (p=0.04) and muscle mass (p=0.0001) were significantly lower than in men. In age group 75-84 years the values of muscle strength (p=0.04), muscle mass (p=0.005) and physical performance (p=0.04) women were significantly lower than in men. There was no association between the diagnostic components of sarcopenia and RA activity. Muscle mass in women with high RA activity was significantly lower than women with low activity (p=0.0001) and men (p=0.0001), regardless of the DAS28 (p=0.06). Patients on combination treatment (methotrexate and glucocorticoids) had significantly lower muscle strength (p=0.01), muscle mass (p=0.01) and physical performance (p=0.04) compare to the patients receiving methotrexate monotherapy or other DMARD regardless of glucocorticoids intake (p=0.06).
Conclusion: In women, muscle strength, muscle mass, and physical performance decreased with age and were significantly lower than in men. Sarcopenia was more common in women with high RA activity and was associated with low muscle mass. Glucocorticoid use was associated with low values of muscle strength, muscle mass, and physical performance.

P1543

INVESTIGATING THE LINK BETWEEN URINARY ALBUMIN EXCRETION AND OSTEOPOROSIS IN HOSPITAL AND COMMUNITY COHORTS

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Objective: Chronic kidney disease (CKD) is increasingly recognized as a complex condition with potential implications for bone health. The relationship between urinary albumin-to-creatinine ratio (UACR) and osteoporosis remains incompletely understood, particularly across different kidney disease stages.
Material and Methods: We conducted a crossectional analysis across hospital-based and community-based cohorts from four distinct populations, including TAKO (TAiwan Kidney Outcome Study, N=25,626), KHNHANES (Korea National Health and Nutrition Examination Survey, N=1,868), US NHANES (United State National Health and Nutrition Examination Survey, N=3,298), and TWBB (Taiwan BioBank, N=9,844). Baseline characteristics, including age, sex, hypertension, diabetes, body mass index (BMI), estimated glomerular filtration rate (eGFR), and UACR were compared. Logistic regression models were employed to investigate the association between UACR and osteoporosis, with adjustments for key confounding variables. Stratified analyses were performed by sex and CKD stages.
Results: UACR was positively associated with osteoporosis in individual meta-analysis of four cohorts, particular in the TAKO and TWBB cohorts. Although US NHANES and KHANES datasets demonstrated a similar positive association, these cohorts lacked statistical power. Notably, sex-specific analyses revealed a distinct pattern: among female participants with CKD stages 1-3, UACR showed a positive association with osteoporosis, whereas this relationship was absent in stages 4-5. In contrast, male participants did not exhibit such a stage-specific pattern.
Conclusion: This study elucidates the relationship between UACR and bone health across hospital-based and community-based population. UACR showed a positive association with osteoporosis, particularly in females and the early stage of CKD.

P1544

FIBROBLAST GROWTH FACTOR (FGF)-21 AND ITS CORRELATIONS WITH DISEASE CHARACTERISTICS IN RHEUMATOID ARTHRITIS

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Fibroblast growth factors (FGFs) are a family of cell signaling proteins produced by macrophages. FGF21 is secreted primarily by the liver, regulating simple sugar consumption and preference for sweet foods. Increased FGF21 is associated with energy deficiency.
Objective: to study FGF21 levels in patients with rheumatoid arthritis (RA).
Materials and methods. The study assessed 88 women with RA. The average age was 54.2±12.0 (51.7-56.7) years, BMI - 28.5 [24.1-32.3], disease duration - 10 [4.5-17.0]. Laboratory examination was standard, FGF21 level - by enzyme immunoassay using HUMAN FIBROBLAST GROWTH FACTOR 21 (FGF-21) ELISA KIT. The obtained results were analyzed by STATISTICA 10.
Results: No correlation was found between the FGF21 level and RF, ACPA, CRP, DAS 28, clinical and X-ray stage of the disease, or functional class of the disease.

A negative correlation was found between FGF-21 and the duration of the disease (ρ= -0.22; p=0.041), and a positive correlation was found with ESR (ρ=0.35; p=0.0023). High levels of FGF-21 were observed in patients taking GC at the time of the study (Z=3.25; p=0.001; 983 [556-179.9]) versus patients not taking GC (398 [239-936]).
Discussion: FGF21 improves tissue sensitivity to insulin, helps to reduce serum glucose levels and reduce body weight. Short-term high FGF21 is observed during fasting and overeating. Increased FGF-21 levels in RA patients taking glucocorticoids (GC) at the time of the study are likely due to the effect of GC on carbohydrate and fat metabolism. GC interference in all levels of carbohydrate metabolism leads to energy metabolism disorder, contributing to an increase in FGF21. With prolonged energy metabolism disorder, there is a redistribution of the mass fraction of fat and muscle tissue, a decrease in the percentage of the latter. Probably, a decrease in active muscle mass as a result of a long-term illness leads to a decrease in the body's need to release fast energy fuel - glucose and, as a consequence, to a decrease in the FGF21 level in long-term RA patients.
The correlation between ESR and FGF21 levels is more difficult to explain, since we did not find other associations of FGF21 with RA activity. Probably, FGF21 is indirectly associated with frequent use of GC with high ESR.

P1545

TYPICAL OSTEOPOROTIC FRACTURES IN THE BACKGROUND OF OSTEOPENIA

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Objective: Densitometry (DXA) is the most widely used method and the gold standard for the diagnosis and treatment of osteoporosis. Low-energy fracture is a typical complication of osteoporosis.
According to the definition of the World Health Organization, osteopenia is determined by bone densitometry as a T index from -1 to -2.5.
Trabecular bone index (TBI) provides an indirect idea of the state of bone tissue microarchitecture during routine dual-energy X-ray osteodensitometry and has prognostic properties for low-traumatic fractures.
Trabecular bone score (TBS) is one of the most widely used assessments of bone tissue quality. Previous studies have shown that TBC predicts fractures independently of BMD.
Methods: 142 patients with a history of fractures were observed (44 men and 98 women, aged 40 to 70 years, average age 56.3±1.1 years). Moreover, these fractures were significantly more common among women than men (p<0.001). All patients underwent a 10-year fracture risk calculation (https://www.sheffield.ac.uk/FRAX/tool.aspx?lang=rs). The obtained result was compared with the threshold of therapeutic intervention developed for the Russian Federation. All patients also underwent densitometry (DXA).
Results: Vertebral fractures were detected in 62 (44%) of the examined patients, 39 (27%) fractures of the proximal femur, 25 (18%) fractures of the radius and 16 (11%) proximal humerus. According to the results of densitometry (DXA), no decrease in bone mineral density (BMD) in the lumbar vertebrae and femoral neck was detected. However, a low TBS of L1–L4 was noted, associated with a high risk of new low-trauma fractures.
Conclusion: According to the study, low TBS is associated with a high risk of typical fractures against the background of osteopenia. Determining the TBS score to FRAX and/or BMD improves prediction of fracture risk not only in osteoporosis, but also in osteopenia, which contributes to the correct decision-making on treatment methods and monitoring.

P1546

FREQUENCY OF ATYPICAL FRACTURES DURING ANTI-OSTEOPOROSIS THERAPY

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Objective: Bisphosphonates are first-line drugs for the prevention of osteoporosis and fracture prevention. Their findings include a selective effect on bone tissue, which has a powerful ability to increase bone mineral density (BMD) among all known antiresorptive agents and a low frequency of exposure, the risk of which is lower compared to the benefits of the drugs. However, in recent years, the number of cases of atypical femoral fractures (AFF) has increased during long-term treatment with bisphosphonates.
Methods: We observed 96 women who took bisphosphonates and had a history of atypical femoral fracture. The mean age of patients is 63.5±2.8 years, the average duration of bisphosphonate use is 6.6 years. Data on risk factors, including the use of bisphosphonates, were obtained using medical records. Fractures were confirmed radiologically. The studied patients underwent clinical and radiological examination, as well as densitometry.
Results: When examining patients by densitometry, osteoporosis was detected in 54 patients (56%), osteopenia - in 42 patients (44%). As a result of the obtained data, typical radiological signs of atypical fracture were accidentally observed more often in patients who entailed treatment with bisphosphonates compared to patients who did not use them as treatment ($p < 0.001$).
Conclusion: The researchers concluded that atypical changes may be a manifestation of the influence of bisphosphonates.

P1547

ASSESSMENT OF CELLULAR AND HUMORAL IMMUNITY INDICATORS IN THE DEVELOPMENT OF JUVENILE IDIOPATHIC ARTHRITIS IN CHILDREN

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Objective: Juvenile idiopathic arthritis (JIA) is the most severe and disabling form of chronic pathology in children and adolescents. Early diagnosis and treatment of idiopathic arthritis in children is one of the most pressing problems in pediatrics. Currently, and throughout the world, there is a tendency towards a steady increase in the prevalence of rheumatic diseases in both the general and pediatric populations.
Methods: The study included 84 children with a confirmed diagnosis of juvenile arthritis. The role of the cellular and humoral components of the immune system in the development and formation of juvenile idiopathic arthritis was assessed, in particular the CD3 and CD8 indices.
Results: The analyzing the immunological parameters of the cellular and humoral components of the immune system in children with juvenile rheumatoid arthritis, the CD3 - T lymphocytes parameters had significant differences from the norm and, depending on the form of the disease, tended to increase (N - 50.25±4.59%; polyarticular form of JIA - 61.00±2.09%; systemic form of JIA - 68.97±5.115%), which confirmed the hyperactivity of the immune system and the immunoproliferative nature of the disease. The CD3- T lymphocytes and CD8- cytotoxic lymphocytes parameters in children with JIA were significantly higher ($P<0.05$) than the normal level.
Conclusion: The results of the study indicate that other immunological markers, CD3 T lymphocytes and CD8 cytotoxic lymphocytes, are also detected with equal or greater frequency in children with early JIA. The frequency of increase and concentration levels of these indicators were higher than in healthy children.

P1548

ANALYSIS OF THE QUALITY OF LIFE IN PATIENTS WITH ANKYLOSING SPONDYLOARTHRITIS AND NSAID-GASTROPATHY RECEIVING COMBINED GASTROPROTECTIVE THERAPY

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Objective: Non-steroidal anti-inflammatory drugs (NSAIDs) occupy one of the leading positions in terms of the volume of use as therapy for ankylosing spondylitis (AS). Despite a number of positive aspects from taking NSAIDs, at the same time, this group of drugs is characterized by the development of class-specific side effects from the cardiovascular system (CVS), gastrointestinal tract (GIT), kidneys, liver, which also leads to a deterioration in the quality of life of patients.
Methods: We examined (according to the SF-36 questionnaire) in 90 patients with AS aged 34-49 years. The average age was 39.8±2.4 years. The control group consisted of 45 practically healthy volunteers (36 men and 9 women); both groups were comparable by gender and age. For 6 months, all patients with AS received NSAIDs, for the purpose of gastroprotection 30 (33%) patients received PPI (Omeprazole), 27 (30%) – PPI (Omeprazole) and Rebamipide, 15 (17%) – Rebamipide, 18 (20%) patients did not systematically take gastroprotective drugs.
Results: In patients with AS, compared to the control group, physical and psychological indicators the quality of life (QOL) are reduced ($p<0.001$). QOL of patients with AS worsens with increasing inflammatory activity of the disease, functional limitations, joint manifestations and enthesitis. Coxitis, detected in 76.7% of patients, has an adverse effect on the scale of role physical functioning. QOL indicators were higher in patients taking PPI (Omeprazole) + Rebamipide. When assessing the impact of drug therapy on QOL in patients taking monotherapy with only Proton

pump inhibitors (PPI) like Omeprazole and Rebamipide, compared to the control group, statistically significantly worse indicators were noted on all scales of the SF-36 questionnaire (p<0.001). In patients who took only PPI for gastroprotection, QOL indicators were also worse than in the control group (p<0.001). In patients receiving PPI (Omeprazole) + Rebamipide, a number of QOL parameters according to the SF-36 questionnaire were comparable with the corresponding QOL indicators in the group of practically healthy people.

Conclusion: Patients with AS have significantly lower physical and psychological QOL indicators than healthy people. Deterioration in QOL is noted as the inflammatory activity of AS and functional limitations increase. No effect of socio-demographic factors on the QOL of patients with AS was found. Therapy with PPI (Omeprazole) and Rebamipide provided a higher QOL in patients with AS than other types of treatment.

P1549

MACHINE LEARNING MODELS FOR CLASSIFYING NECK-SHOULDER PAIN BASED ON SMARTPHONE USAGE CHARACTERISTICS

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Objective(s):
The widespread use of smartphones has increased musculoskeletal discomfort, particularly neck-shoulder pain (NSP). This study aimed to develop machine learning models to classify NSP based on smartphone usage characteristics and personal traits.

Material and Methods:
A total of 188 non-NSP and 160 NSP participants aged 20-50 years participated. Participants with NSP were eligible if they reported their neck-shoulder pain on the Cornell Musculoskeletal Discomfort Questionnaire (CMDQ). 18 Features included demographics (sex, age, BMI, job, vision status) and smartphone usage variables (usage time, smartphone sizes, weight, body postures, neck postures, hand postures, and usage purposes such as video watching, social media, and others). The complete dataset (n = 348) was split into a training set (80%, n = 278, NSP = 128, non-NSP = 150) and a test set (20%, n = 70, NSP = 32, NSP-free = 38) for external validation. Four machine learning models—Random Forest, SVM, Logistic Regression, KNN—were trained and evaluated using AUC, Accuracy, and F1-Score. Random Forest performance was further interpreted using SHapley Additive Explanations (SHAP).

Results:
The Random Forest model performed best (AUC: 0.721, Accuracy:0.693, F1: 0.691) in classified smartphone users with and without neck-shoulder pain. Smartphone usage time and neck posture were identified as the most critical predictors. SHAP analysis showed that moderate smartphone use (1-4 h/day) reduced the likelihood of neck-shoulder pain, whereas prolonged use (7-10 h/day) increased the risk. Similarly, neck posture (reduced neck flexion) and upright body posture (sitting) significantly reduced the likelihood of discomfort, while non-optimal postures increased it. Additional insights indicated that avoiding video watching, maintaining normal vision, and listening to music while using smartphones were associated with a lower risk of neck-shoulder pain.

Conclusion(s):
This study highlights the importance of smartphone usage time, posture, and other factors in predicting neck-shoulder discomfort. Machine learning models, particularly Random Forest combined with SHAP analysis, provide valuable insights for identifying high-risk behaviors and guiding interventions to reduce musculoskeletal pain.

P1550

A SHORT-TERM CLINICAL EFFICACY ANALYSIS OF MR-GUIDED VERTEBROPLASTY FOR THE THORACOLUMBAR SPINE

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抽象：
目的：比较 MR 引导下 PVP 手术技术与常规透视辅助单侧穿刺椎体成形术 （PVP） 治疗老年骨质疏松性椎体压缩骨折 （OVCFs） 患者的短期临床疗效。方法：共有 100 名 OVCF 受试者 （从 2022 年 3 月至 2024 年 1 月） 在北方战区总医院骨科接受了单节段经皮椎体成形术，并在本回顾性研究中进行了测试。将这些受试者随机分为 MR 指导组（MR 引导的 PVP 手术组）和对照组（常规透视组），共 50 例受试者（MR 指导组：23 名男性和 27 名女性受试者，年龄 72.72 ± 8.38 岁;对照组：25 名男性和 25 名女性受试者，年龄 72.66 ± 6.05 岁），以及两组间透视次数指标， 评估不同时间点的疼痛评分、骨水泥用量、骨水泥渗漏率和术后并发症。结果： MR 引导组透视次数 （14.00 倍 [13.00， 15.00]） 低于对照组 （20.50 倍 [19.00， 21.00] P<0.001）。MR 引导组的 VAS 评分在穿刺定位 （p<0.001）、术后即刻 （p<0.001） 和术后第 1 天 （p<0.001） 方面均显著低于对照组。与对照组相比，MR 指导组骨水泥用量 （6.00 [6.00， 6.00]，P<0.001） 大于对照组 （5.00 ml [5.00， 5.00]）。MR 引导组骨水泥渗漏率 （2%） 大于对照组 （8%），但差异无统计学意义 （P>0.05）。两组并发症发生率也无统计学意义 （P>0.05）。结论：与传统透视手术相比，MR 引导的 PVP 手术可显着减少荧光计的数量、额外的辐射风险和即时疼痛，并可改善骨水泥对 OVCF 患者的弥散量。

P1552

VITAMIN D STATUS OF GUANGZHOU SUBJECTS AGED≥40 YEARS IN SUMMER

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Objective: We aimed to describe the vitamin D status of Guangzhou subjects aged ≥40 years in summer. **Method:** In the present study, serum 25-hydroxyvitamin D (25(OH)D) and serum calcium were examined of 590 subjects aged ≥ 40 years from 1 May to 31 Oct. Results: We had to exclude 238 males with average level of 25(OH)D was (57.09±24.06) nmol/L, and 352 females with average level of 25(OH)D was (53.71±22.63) nmol/L. Among our subjects, the normal vitamin D status accounted was 24.79%, vitamin D deficiency was 33.19%, insufficiency was 34.45%, serious vitamin D deficiency was 7.56% in group Male. The normal vitamin D status accounted was 15.63%, vitamin D deficiency was 40.63%, insufficiency was 37.22%, serious vitamin D deficiency was 6.53% in group Female. Vitamin D inadequacy existed generally in subjects aged ≥ 40 years. There was statistic difference between males and females subjects aged ≥ 80 years (P= 0.026, P= 0.043).

Conclusion: Vitamin D deficiency and insufficiency is very common in subjects aged ≥ 40 years living in Guangzhou in summer. In subjects aged ≥ 80 years, Male group was significantly higher than Female group. Vitamin D intakes should be taken into account.

Key words: Vitamin D; 25-hydroxyvitamin D; Vitamin D insufficiency; Vitamin D deficiency

P1553

SMART WALKER IMPLEMENTATION IN POSTOPERATIVE HIP FRACTURE REHABILITATION: FEASIBILITY AND IN-HOSPITAL OUTCOMES

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Introduction Achieving independent mobility after hip fracture surgery is vital for enhancing quality of life (QoL) and lowering the likelihood of complications. The use of advanced technology in mobility aids represents a growing trend aimed at improving patient recovery. This study investigates the impact of a smart walker compared to a standard walker in aiding postoperative walking rehabilitation for hip fracture patients.

Materials and Methods A prospective cohort design was employed, involving patients treated surgically for hip fractures at our institution between August 2023 and June 2024. Participants were grouped based on their preference and familiarity with either a traditional or smart walker. Evaluations were conducted pre- and post-rehabilitation, focusing on walking ability, mental health, independence in daily activities, QoL, hip range of motion (ROM), muscle strength, gait patterns, and a 10-meter walking test.

Results Thirty-two participants (mean age: 81.7 years; 19 females, 13 males) were included, equally split between the two walker groups. Both devices proved effective for recovery, but the smart walker group exhibited notable advantages in hip ROM, mobility, walking speed, and physical functionality. Although overall rehabilitation outcomes between the two groups were comparable, the smart walker showed superior benefits in specific areas.

Conclusion The findings suggest that walking aids significantly support recovery after hip fracture surgery, with the smart walker offering enhanced rehabilitation outcomes in targeted metrics. While the follow-up period was brief, extended use of smart walkers may yield further improvements in mobility, recovery speed, and autonomy in daily activities.

Keywords: smart walker, traditional walker, hip fracture recovery, mobility aids, postoperative rehabilitation, quality of life

P1554

USING QUALITY MONITORING TOOLS TO IMPROVE THE ENROLLMENT RATE OF OSTEOPOROSIS PATIENTS

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Objective

Osteoporosis is a global health issue, particularly with a high incidence and risk of complications among the elderly. However, many osteoporosis patients fail to receive timely diagnosis, education, and treatment, leading to fractures and worsening health conditions. It is hoped that through the use of quality monitoring tools, the enrollment rate of osteoporosis patients can be improved, especially by conducting FRAX fracture risk assessments for patients with non-traumatic fractures to promote early diagnosis and intervention measures.

Methods

- Research Design and Scope

Time Frame: January 1, 2024, to December 31, 2024.

Subjects: Hospitalized and outpatient patients aged ≥50 years who have been diagnosed with non-traumatic fractures.

- Quality Monitoring Indicators

Name: Rate of FRAX Fracture Risk Assessment Completion Within 8 Weeks for Patients with Non-Traumatic Fractures.

Formula:

$$\text{FRAX Assessment Rate}(\%) = \left(\frac{\text{Number of eligible patients who completed FRAX assessment within 8 weeks}}{\text{Total number of eligible patients with non-traumatic fractures}}\right) \times 100$$

Threshold Setting: ≥50%

- Implementation Measures

1. Develop Standard Operating Procedures (SOPs):

Establish comprehensive SOPs that cover the roles of physicians, nursing staff, and patient education processes for managing osteoporosis patients.

2. Regular Training and Awareness Programs:

Conduct periodic training sessions and awareness campaigns to emphasize the importance of enrolling osteoporosis patients,

especially those with non-traumatic fractures, into monitoring programs.
3. Host Osteoporosis-related Educational Programs:
Organize educational courses to raise public awareness about osteoporosis, its risks, and provide initial screening for the disease.
- Data Collection and Analysis

1. Monthly Statistics on FRAX Risk Assessment Completion:
Track and calculate the percentage of non-traumatic fracture patients who complete the FRAX risk assessment each month.
2. Quarterly Team Meetings for Review and Improvement:
During each quarterly team meeting, review the reasons for not meeting the target and propose strategies for improvement.

Results
- Monthly Evaluation Results

1. Average Completion Rate from January to December 2024:
The average completion rate is 61.79%, which meets the set threshold.
2. Quarterly Completion Rate Trends:
The completion rate fluctuated significantly in the first quarter, but from the second quarter onward, it showed a steady improvement, reaching a peak of 77.50%.
- Key Findings

1. Significant Improvement in FRAX Risk Assessment Completion Rate:
After implementing quality monitoring, the completion rate of the FRAX risk assessment showed a significant increase.
2. Higher Proportion of Successfully Enrolled Patients:
The proportion of successfully enrolled patients increased, effectively promoting the diagnosis of osteoporosis and the initiation of related interventions.

Conclusion
This study shows that through quality monitoring tools, the enrollment rate of osteoporosis patients can be significantly improved, particularly for those with non-traumatic fractures. Establishing clear indicators and standardized intervention measures can enhance assessment efficiency and execution outcomes. Future research should further explore the effectiveness of this approach in the long-term prevention of fracture risks.

P1555

A DECADE OF EXPOSURE: LONG-TERM AIR POLLUTION AND ITS ASSOCIATION WITH OSTEOARTHRITIS RISK - A NATIONWIDE COHORT STUDY IN TAIWAN

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Objective: This research examines the effects of prolonged exposure to air pollution on the risk of developing osteoarthritis (OA) in Taiwan. The study evaluates ten years of exposure to multiple pollutants, including sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter (PM10 and PM2.5), nitrogen oxides (NOx), nitrogen monoxide (NO), nitrogen dioxide (NO_2), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), and methane (CH_4).
Design: A retrospective cohort analysis was conducted using data from Taiwan's National Health Insurance Research Database (NHIRD) linked with air quality measurements from 76 environmental monitoring sites. The study followed 526,630 individuals without a prior OA diagnosis over a decade. Daily cumulative averages of pollutant levels were calculated, and the association with OA onset was analyzed using Cox proportional hazards models, with adjustments for demographic and clinical variables.
Results: Long-term exposure to air pollutants was significantly associated with increased OA risk. Hazard ratios (HRs) for each standard deviation increase in pollutant levels were as follows: SO_2 (1.40), CO (1.83), PM10 (1.58), PM2.5 (1.53), NOx (1.59), NO (1.45), NO_2 (1.62), THC (1.75), NMHC (1.23), and CH_4 (2.76). Among these, CH_4 exhibited the strongest correlation, with a 176% rise in OA risk per standard deviation.
Conclusions: This study establishes a clear link between chronic air pollution exposure and a higher likelihood of developing OA. The findings emphasize the necessity of effective air quality management to reduce the public health burden of OA. These insights provide valuable evidence for identifying environmental risk factors and guiding preventive strategies.
Keywords: Osteoarthritis, Air pollution, Chronic exposure, Particulate matter, Gaseous pollutants, Public health policy.

P1556

ADVANCEMENTS IN REGENERATIVE MEDICINE IN TAIWAN: EVALUATING THE EFFICACY OF PERIPHERAL BLOOD MONONUCLEAR CELL PURIFICATION (PCP) THERAPY FOR OSTEOARTHRITIS

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Objective
Osteoarthritis (OA) is a prevalent degenerative joint disease that affects approximately 54 million people in the United States, according to CDC data in 2023. In Taiwan, over 3.5 million people are afflicted with OA, and treatment options vary based on the severity of joint degeneration. Total Knee Arthroplasty may be necessary in advanced stages. Peripheral Blood Cell Purification (PCP) utilizes the differentiation of monocytes into M2 macrophages, which exhibit anti-inflammatory properties and immunomodulatory functions. This report presents the outcomes of PCP in reducing pain, improving joint mobility, and delaying cartilage degeneration.
Material and Methods
Autologous peripheral blood (100–120 mL) was collected including 2.5 hours of cell separation and purification, followed by

the culture of 1–2×10^8 PCP in 4 mL, with knee joint injection performed on the same day. Pain levels were assessed by using the Defense and Veterans Pain Rating Scale (DVPRS) and the Knee Injury and Osteoarthritis Outcome Score (KOOS) both pre- and post-treatment. Radiographic imaging follow-up was conducted six months after treatment.

Results

The DVPRS scores for Case 1 and Case 2 decreased from 9 and 8 to 0, respectively. The KOOS scores demonstrated a significant enhancement in joint mobility six months following treatment, with Case 1 improving from 45 to 84 and Case 2 from 35 to 100. Imaging follow-up at the six-month mark revealed a notable widening of the joint space (Figure 1), contributing to a reduction in knee joint wear and tear. The decline in pain correlated with increased mobility for both cases (Figure 2).

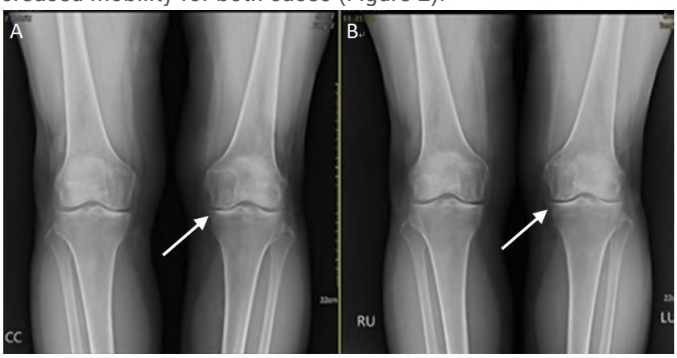

Figure 1:X-ray image before(A) and post(B) 6 months PCP treatment

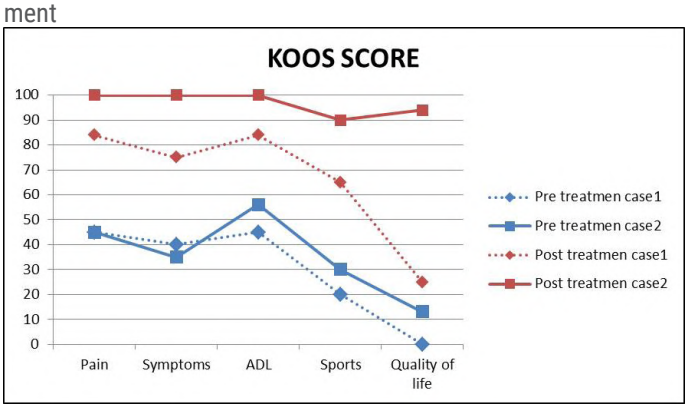

Figure 2 : Knee Injury and Osteoarthritis Outcome Score

Conclusions

PCP effectively suppresses inflammatory responses. This therapy demonstrated the significant efficacy in treating osteoarthritis (OA) by reducing joint pain, improving motor function, and enhancing quality of life, making it a fast, safe, and effective new treatment option.

P1557

PREDICTORS OF MORTALITY IN RHEUMATOID ARTHRITIS: A RETROSPECTIVE REAL LIFE STUDY

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Objective:

To identify key predictors of mortality in patients with rheumatoid arthritis (RA)

Material and methods:

In a retrospective cohort study, an administrative database from the Rheumatology Clinic of the IMHAT "St. Marina", Varna, Bulgaria, of RA patients was analyzed. Study period -from the start of biologic til Oct. 2024 or death. Demographic characteristics (age, smoking, BMI), disease-related factors (duration of RA, time to bDMARD, functional stage), and treatment (methotrexate and methylprednisolone use) as well comorbidities were assessing. Cox regression was applied to assess the risks of mortality.

Results

190 patients treated with biologics for a period of 4 to 19 years (mean = 9.33, SD = 2.35). The mean age of the patients was 64.1 years (25-86), 14.7% were women, mean duration of RA was 17.8 years (8-50), mean duration of treatment (years) was 9.32 (4-15). The analysis period included 1772 years of treatment.

Patients were treated with TNF and IL-6 inhibitors (55.3% vs. 44.7%, p>0.05). 65.8% and 45.8% of them were in radiographic stage III or IV and functional stage II or III (p <0.001 and p >0.05, respectively). A significant proportion were taking steroids and were on combination with methotrexate (p=0.042 and <0.01, respectively). 58.9% of patients had HTN, 12.1%- IHD, 9.5%- CVD, 7.4%- pulmonary, 8.4%- renal disease and 15.3%- diabetes mellitus.

The average mortality rate was 112,9 for the 1772 treatment years.

More advanced functional disability leads to an increased risk of mortality (HR = 9.127, 95% CI 2.185–38.132, p = 0.002), longer time from diagnosis to initiation of biological therapy significantly increases the risk of mortality (HR = 6.240, 95% CI 3.306–11.775, p < 0.001). Interestingly, the duration of RA was associated with protection against the risk of mortality (HR = 0.152, 95% CI 0.079–0.295, p < 0.001). Age, sex, BMI, smoking, comorbidities, did not show a statistically significant relationship with mortality rates.

Conclusion

The results highlight the importance of functional status and time to initiation of biologic therapy as key risk factors for mortality in RA. Early and adequate treatment, such as with ts/bDMARDs, could prevent invalidation and thus contribute to improving long-term outcomes.

P1558

TYROSINEMIA TYPE 1 MANIFESTING AS HYPOPHOSPHATEMIC OSTEOMALACIA IN A YOUNG ADULT

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Objective: We present a clinical case of HT-1 in a young adult, which manifested as hypophosphatemic osteomalacia. Tyrosinemia type 1 (hepatorenal tyrosinemia, HT-1) is a rare autosomal recessive disorder caused by mutations in *FAH* gene encoding fumarylacetoacetate hydrolase. This genetic alteration leads to the accumulation of tyrosine and its metabolites, which exert cytotoxic effects on cells. HT-1 can cause progressive damage to the liver and kidneys, as well as severe neurological complications. Clinically, HT-1 can present from the early neonatal period (characterized by its most aggressive form) to adolescence (manifesting as a slowly progressive disease).
Materials and methods: Whole-exome sequencing was performed on G400 (BGI, China).
Results: A female patient noticed pain in the costosternal joints, pelvic bones, hip joints, knee joints, and feet, without clinically significant improvement despite analgesic treatment at the age of 19. At the age of 24, hypophosphatemia and fractures of proximal femoral metaphyses and metatarsals of both feet were revealed for the first time. The patient's height is 150 cm, weight 46kg. Medical history reveals early closure of the anterior fontanelle and delayed eruption of deciduous teeth with otherwise normal development. During admission to our center at the age of 24, she had complaints of muscle weakness, waddling gait, bone and joint pain. Hypophosphatemia (0.54 mmol/L (0.74-1.52)) and hyperphosphaturia (TRP 54%) were identified alongside with elevated alkaline phosphatase (176 IU/L (40-150)), hypouricemia, glucosuria and proteinuria. Imaging revealed multiple vertebral compression fractures (Th1,4,5-10,L5). FGF23-producing tumor was excluded by ^{99m}Tc-Tectrotide scintigraphy. Therapy with alfacalcidol and phosphate was initiated. Due to suspected Fanconi syndrome, whole-exome sequencing was performed, which revealed a compound heterozygous mutation in the *FAH* gene (NM_000137.4, c.374C>T/c.192G>T (p.Thr125Ile/p.Gln64His)), confirming the diagnosis of HT-1. Further examination showed signs of macro-nodular cirrhosis and a focal lesion in segment 8 of the liver, with no evidence of hepatocellular carcinoma. The patient has been prescribed therapy with nitisinone and low-tyrosine diet.
Conclusion: HT-1 necessitates early diagnosis to prevent the development of severe complications. Newborn screening for tyrosinemia is not implemented worldwide, though it is crucial for a timely diagnosis and medical intervention. Our case shows that HT-1 can manifest in young adults as hypophosphatemic osteomalacia.

P1559

TRANSITION OF HYPOPHOSPHATASIA TREATMENT WITH ASFOTASE ALFA FROM CHILDHOOD TO ADULTHOOD.

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Hypophosphatasia (HPP) is genetic disease characterized by impaired mineralization and systemic disabling complications due to alkaline phosphatase (ALP) deficiency which is treated by enzyme replacement therapy with asfotase alfa.
We report two cases of hypophosphatasia with successful continuity of asfotase alfa treatment from childhood to adulthood.
Clinical case 1: a girl with signs of rickets and growth retardation starting at age 3 months, X-ray signs of severe rickets, along with consistently very low ALP (5-20 IU/l), elevated phosphate and genetic confirmation TNSALP (p.T85P and p.E191K). The premature loss of deciduous teeth started at age 1. She suffered from keeled chest deformity, scoliosis, bone and joint pain and poor physical performance. Asfotase alfa was started at age 10 (SDS height:-1,93, BMI SDS:-3,13) at a dose of 2 mg/kg 3 times/week subcutaneously. This patient was transferred to adult department at age 18 at the height 164 cm, (SDS: 0,64, midparental height 166,5 cm SDS: 0,75 vs normal), weight 50 kg, BMI: 18.4 kg/m^2), scoliosis, but no other visual bone deformities. Her physical performance (6 min walking test, 10 second chair rise test and grip strength) were as expected for a healthy adult. She has continued receiving treatment with asfotase alfa with the only side effect of skin reaction.
Clinical case 2: a boy with signs of rickets and growth retardation starting at age 3 months, delayed motor development without the ability to walk independently until 2.5 years old. He had a left shin facture at age 3 and sacrum fracture at age 5. At age 15 multiple bone deformities were detected, movement limited to a few meters with crutches. At 17 years (SDS height:-3.24) hypophosphatasia was confirmed based on repeatedly low ALP levels, hyperphosphatemia and genetic confirmation ALPL c.302A>G/c.571G>A; asfotase alfa was prescribed at of 2 mg/kg 3 times/week subcutaneously. Currently he has received asfotase alfa for 6 years. The patient is able to walk independently with 6 min walking test, chair rise test and grip strength corresponding to the normal for a young adult. He had to undergo surgery to correct valgus deformities. However, his height is 155 cm (SDS: -2.96).
Both patients are able to study/work and lead an active lifestyle.
Conclusion: asfotase alfa is effective at preventing fragility fractures, further bone deformities and maintaining normal physical activity in transition from childhood to adulthood with better outcomes when started from a younger age.

P1560

TWO YEAR OUTCOMES OF BUROSUMAB TREATMENT VERSUS SURGERY IN TUMOR-INDUCED OSTEOMALACIA

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This study compares the effectiveness of burosumab treatment and surgical resection in patients with tumor-induced osteomalacia (TIO).

Methods: We evaluated TIO patients (July 2018 - December 2024), who either received burosumab treatment or underwent surgery leading to remission and were followed-up for 24 months. iFGF23 levels were measured using the Biomedica ELISA Kit (BI-20700), with healthy controls -14.8 [3.8; 25.0] pg/mL. Phosphate (0.74-1.52 mmol/L), alkaline phosphatase (40-150 IU/L), parathyroid hormone (15-65 ng/mL) were measured by routine methods. Tubular reabsorption of phosphate (TRP) was calculated via the Scymed website. Pain was assessed on a scale from 0 (no pain) to 10 (extreme pain). Bone Mineral Density (BMD) was assessed by iDXA, GE.

Results: We enrolled 31 patients with TIO: 26 (7 female, 26.9%; mean age 52 ± 8 years, weight 75 ± 18.4 kg) who underwent successful surgery and 7 who received burosumab because surgery was not possible or was not effective (2 female, 28.6%; mean age 47 ± 9 years, weight 81 ± 22.2 kg). Burosumab was started at a dose of 0.5 mg/kg with maximum dose escalation to 2 mg/kg. Biochemical values at baseline were similar between burosumab vs surgery patients: serum phosphorus 0.46 ± 0.1 vs 0.52 ± 0.3 mmol/L, PTH 82 ± 44 vs 87 ± 33 ng/mL, intact FGF-23 789 ± 500 vs 856 ± 257 pg/mL, TRP 57 ± 17 vs 62 ± 14 %, ALP 223 ± 76 vs 254 ± 65 IU/L. At diagnosis, all patients had multiple fractures and a mean height reduction of 18±7cm.

After 24 months, BMD increase at the total hip (TH) of 18 ± 14% and femoral neck (FN) 20 ± 27% in the burosumab group and surgery group TH 21 ± 11% and FN 19 ± 15% . No new fractures were registered in either group. Prior to treatment, pain scores 8 ± 1 in the burosumab group and 7 ± 2 in the surgery group, and post-treatment scores dropped to 2 ± 1 for both groups. In the burosumab group, phosphate normalized (0.9 ± 0.3 mmol/L) in 6 out of 7 subjects, with burosumab mean dose of 1.2 ± 0.6 mg/kg every 4 weeks. In the surgery group, phosphate normalized (1.5 ± 0.2 mmol/L) in all subjects.Burosumab was well tolerated, no side effects were registered. In one case the response was partial most likely due to insufficient dose as this was the largest tumor volume (unresectable 40mm sacral tumor) and the highest FGF-23 (4588.3 pg/mL).

Conclusion: Burosumab is a promising alternative to surgery for inoperable or occult FGF23-producing tumors, effectively normalizing phosphate levels, increasing BMD, preventing fractures, and relieving pain. Initial FGF-23 levels may influence the required burosumab dose for recovery.

P1561

FILLING GAPS IN TELEREHABILITATION: ASSESSING RELIABILITY OF REMOTE PERFORMANCE-BASED OUTCOME ASSESSMENT

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Objective: The purpose of this study was to evaluate the reliability of three widely utilized performance-based outcome measures—the Timed Up and Go (TUG), Four-Meter Walk (4MW), and Five-Repetition Sit-to-Stand (5XSTS)—across two remote assessment modalities: synchronous and asynchronous, with participants serving as their own timers in both scenarios.

Materials and Methods: A total of 58 participants were randomized into six groups, completing assessments in different sequences for in-person, remote synchronous, and remote asynchronous. Participants performed the 4MW and TUG at normal walking speeds, while the 5XSTS was completed as rapidly as possible. In the synchronous and in-person mode, participants timed themselves under real-time supervision by a trained researcher; while in the asynchronous mode, participants timed themselves and relied solely on instructional videos and written guidance. Reliability was assessed using the second trial to mitigate potential biases related to learning effects, with Intraclass Correlation Coefficients (ICCs) serving as the primary metric for cross-mode consistency.

Results: Participants were on average 40 years old (range 19–86), confident using technology (97%), managed a medical condition (40%), and managed at least one active pain complaint (12%). The 4MW exhibited good reliability (ICC = 0.76, $p < 0.001$, 95% CI [0.53, 0.88]), the TUG showed good reliability (ICC = 0.884, $p < 0.001$, 95% CI [0.778, 0.942]), and the 5XSTS demonstrated excellent reliability (ICC = 0.94, $p < 0.001$, 95% CI [0.88, 0.97]). Greater variability was observed among older adults, particularly in comparisons of synchronous and asynchronous modalities.

Conclusions: Telerehabilitation is a viable management approach, but barriers exist to its implementation, including the challenges with physical examinations. These findings indicate that performance-based outcome measures can be reliably self-administered with or without real-time assistance from trained staff. This supports the potential for broader implementation of remote self-assessments in clinical and community-based settings. However, further research is warranted to better understand sources of variability, particularly in older adult populations, and to optimize these tools for widespread application.

P1562

NOMOGRAM FOR PREDICTING CEMENTED VERTEBRAL REFRACTURE AFTER PERCUTANEOUS KYPHOPLASTY IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURES

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Background: Cemented vertebral refractures (CVFs) are a common complication following percutaneous kyphoplasty (PKP) in patients with osteoporotic vertebral compression fractures (OVCFs). This study aims to develop a nomogram model for predicting CVFs in postmenopausal women, providing guidance for clinical practice to reduce the incidence of such occurrences.
Methods: The hospitalization records and outpatient follow-up data of 406 patients with OVCFs who underwent unilateral single-segment PKP at Department of Spine Surgery, Peking University People's Hospital, from May 2016 to July 2022, were collected. We utilized univariate analysis and binary logistic regression to identify the risk factors associated with CVF, select relevant variables, and develop a nomogram model. The predictive performance of the nomogram was evaluated using the Receiver Operating Characteristic (ROC) curves, calibration curves, Decision Curve Analysis (DCA), Clinical Impact Curves (CIC) and internal validation through bootstrap with 1000 resamples.
Results: 127 patients were involved, with the CVFs incidence rate of 13.39% (17/127). low CT value, preoperative IVC, high restoration of vertebral height, low postoperative Cobb angle, high restoration of Cobb angle, low bone-cement distribution score and absence of postoperative anti-osteoporosis treatment ($p < 0.05$) were possible risk factors of CVFs after PKP in postmenopausal women. The high restoration of the Cobb angle ($p< 0.001$, OR 1.088, 95%CI 1.043~1.134) and postoperative anti-osteoporosis treatment (p 0.017, OR 0.039, 95% CI 0.003~0.565) are closely related to CVFs. The ROC curves indicate that the Nomogram exhibits a high level of accuracy, with the AUC for both the nomogram and the bootstrap-validated nomogram being 0.966 and 0.753, respectively. The calibration curves, DCA, and CIC demonstrated that the nomogram exhibits favorable predictive capabilities and clinical utility.
Conclusion: The high restoration of Cobb angle and absence of anti-osteoporosis treatment in postmenopausal women with OVCFs increase the risk of CVFs after PKP. The nomogram model developed in this study serves as an effective instrument for predicting CVFs in postmenopausal women.

P1563

ESTABLISHMENT AND VALIDATION OF A NOMOGRAM TO PREDICT INTRADISCAL CEMENT LEAKAGE AFTER PERCUTANEOUS KYPHOPLASTY

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Background: Bone cement leakage is reported to be the most frequent following vertebroplasty. Among these, intradiscal cement leakage is closely associated with disc degeneration and adjacent vertebral body refractures. Therefore, investigating the risk factors associated with intradiscal cement leakage after percutaneous kyphoplasty (PKP) in osteoporotic vertebral compression fractures (OVCFs) and constructing a nomogram prediction model is crucial for assisting spinal surgeons in clinical practice to prevent such occurrences.
Methods: A total of 452 patients with single-segment OVCFs who underwent single-entry PKP at Department of Spinal Surgery, Peking University People's Hospital, from July 2016 to July 2022 were included for inpatient and outpatient follow-up data collection. We utilized univariate analysis and binary logistic regression to identify the risk factors associated with intradiscal cement leakage and developed a nomogram model. The predictive performance of the nomogram was evaluated using the Receiver Operating Characteristic (ROC) curves, calibration curves, Decision Curve Analysis (DCA), Clinical Impact Curves (CIC) and internal validation through bootstrap with 1000 resamples.
Results: 138 patients were included in this study, among which 15 patients suffered from intradiscal cement leakage. The endplate defects ($p<0.001$), low vertebral anterior edge height recovery rate ($p<0.001$), low distance from bone cement to endplate(p 0.020) and contact between bone cement and endplates (p 0.004) are possible risk factors for intradiscal cement leakage following PKP. The endplate defects ($p<0.001$, OR 25.427) and low vertebral anterior edge height recovery rate (p 0.023, OR 0.841) are independent risk factors for intradiscal cement leakage. The ROC curves indicate that the Nomogram exhibits a high level of accuracy, with the AUC for both the nomogram and the bootstrap-validated nomogram being 0.896 and 0.721, respectively. The calibration curves, DCA, and CIC demonstrated that the nomogram exhibits favorable predictive capabilities and clinical utility.
Conclusion: The nomogram model developed in this study serves as an effective instrument for predicting intradiscal cement leakage in OVCFs.

P1564

MOLECULAR AND CLINICAL CHARACTERISTICS OF OSTEOGENESIS IMPERFECTA TYPE VI ASSOCIATED WITH VARIANTS IN THE SERPINF1 GENE

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Background/Objectives: *SERPINF1* gene encodes pigment epithelium-derived factor, which inhibits osteoclastogenesis by regulating osteoprotegerin expression and blocking RANKL-mediated proliferation and differentiation of osteoclast precursors. Homozygous and compound heterozygous mutations in the *SERPINF1* gene lead to the rare Osteogenesis Imperfecta (OI) Type VI. This study aims to investigate the molecular and clinical-radiological features of four patients with OI Type VI caused by pathogenic *SERPINF1* gene variants.

Methods: Data from four OI patients with clinical-radiological symptoms were examined using various methods, including genealogical analysis, clinical examination, radiography, whole exome sequencing, and Sanger sequencing, RT-PCR analysis of fibroblast skin total RNA for diagnosis refinement. Additionally, 801 newborn dried blood spots were evaluated to estimate the frequency of the mutation (c.261_265dup (p.Leu89fs)) in the general population.

Results: In three patients from two unrelated families with severe OI, whole exome sequencing revealed a homozygous variant c.261_265dup (p.Leu89fs) in the *SERPINF1* gene. Given their Tuvinian origin, it was hypothesized that this pathogenic variant might be prevalent in the Tuvan population. Screening of newborns confirmed this hypothesis, showing a carrier frequency of 0.00876 (95% CI: 0.0044872-0.0130328) or 1:114 (95% CI: 1:222-1:77). The fourth patient had previously undescribed variants c.185G>T (p.Gly62Val) and c.992-993insCA (p.Glu33Asnfs) in a compound heterozygous state. To evaluate the impact of the c.992_993insCA variant on protein function, total RNA from the patient's skin fibroblasts underwent RT-PCR analysis and deep sequencing of PCR products. The analysis showed that the c.992_993insCA insertion leads to an 86-amino acid truncation of the protein (p.Glu331Asnfs Ter3), associated with a severe disease progression.

Conclusion: This study elucidates Osteogenesis Imperfecta (OI) Type VI's genetic underpinnings, emphasizing *SERPINF1* gene mutations' impact. Found in Tuvinians, variant c.261_265dup (p.Leu89fs) heavily influences disease prevalence. Unveiling novel *SERPINF1* variants enhances our comprehension of the mutational spectrum, providing valuable insights for future genotype-phenotype correlation studies in Osteogenesis Imperfecta.

P1565

CLINICAL AND GENETIC CHARACTERISTICS OF PATIENTS WITH MONOGENIC FORMS OF OSTEOPOROSIS

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Osteoporosis and low-trauma fractures occurring in childhood without an apparent cause are indicative of the need to search for an inherited skeletal disease. This study examines the molecular and clinical-radiological features of patients with early-onset osteoporosis and spontaneous fractures due to pathogenic variants in *SGMS2*, *FKBP10, PLOD2*, and *GORAB* genes.

Data from 27 patients were analyzed using genealogical, clinical, neurological examinations, radiography, and dual-energy X-ray absorptiometry, complemented by next-generation sequencing (gene panel, whole exome, whole genome).

A heterozygous recurrent *SGMS2* variant: c.148C>T (p.Arg50Ter) was found in 11 individuals from three unrelated families with Calvarial doughnut lesions (CDL) and bone fragility. CT scans detected sclerotic skull lesions in 10 patients, and some experienced recurrent facial nerve paralysis. These findings reveal significant inter- and intrafamilial phenotypic variability.

Bruck syndrome (BS) - 1 and SB-2 were confirmed in 10 and 3 patients, respectively. Eleven nucleotide variants in *FKBP10* and *PLOD2* were identified, with six being novel. The existence of inter- and intrafamilial polymorphism in the severity and course of clinical manifestations among patients.

3 patients with Osteodysplastic gerodermia had new *GORAB* gene variants in a compound heterozygous state: c.170C>G (p.Ser57Ter) and c.790G>C (p.Ala264Pro); c.295C>T (p.Gln99Ter) plus a heterozygous deletion on chromosome 1 affecting the 1st and 2nd exons; c.15G>C (p.Trp5Cys) and a similar deletion. The primary clinical manifestations of the syndrome were wrinkled skin, sagging cheeks, muscle hypotonia, and joint hypermobility. Radiological signs included congenital bilateral hip dislocation, compressive vertebral body fractures. Disruption of the continuity of the epiphyseal growth plate of the distal femur and proximal tibia in the form of an "insertion" was diagnosed in 2 patients.

Genetic factors are a significant cause of recurrent low-trauma fractures occurring in childhood, necessitating the search for such factors in all patients with early-onset osteoporosis.

P1566

IMPROVING INPATIENT MANAGEMENT OF HIP FRACTURES IN OLDER ADULTS: IMPLEMENTATION OF ORTHOGERIATRIC CARE IN TÜRKIYE

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Background/Objectives: Hip fractures in older adults pose significant challenges due to their high morbidity, mortality, and association with frailty and multi-morbidity. Orthogeriatric care integrates geriatrics and orthopedics to optimize outcomes by addressing these complexities through a multidisciplinary approach. This study evaluates the implementation of an orthogeriatric care model and identifies key areas for intervention to improve outcomes in Türkiye.
Methods: An orthogeriatric care model was established in 2018 through a comprehensive review of evidence-based practices, consultation with international experts, and adaptation of protocols to local healthcare resources. Standardized assessments were applied to the hip fracture patients, emphasizing early intervention, prevention of complications, and tailored follow-up care. Data on demographics and clinical characteristics were collected and analyzed for patients managed under this model through June 2024.
Results: The cohort included 156 patients with a mean age of 81.5 ± 7.9 years; 67.1% were female. Patients had an average of 3 chronic diseases and used 5 regular medications. Frailty (79.7%) and malnutrition (50.5%) were highly prevalent. Polypharmacy (≥4 medications) was observed in 54.5%. Only 16.0% had received osteoporosis treatment prior to their current hip fracture. Previous fragility fractures were reported in 22.4%, and of those, only 21.7% had received osteoporosis treatment. Recommendations were made to align with orthogeriatric care principles and improve inpatient outcomes.
Conclusion: The orthogeriatric care model in our clinic has worked to address addresses the unique challenges of managing hip fractures in older adults. Findings highlight critical areas for intervention, emphasizing enhanced interdisciplinary collaboration and proactive management of geriatric syndromes to improve short- and long-term outcomes.

P1567

TURKISH-SPECIFIC MID-UPPER ARM CIRCUMFERENCE THRESHOLDS: INSIGHTS FROM A YOUNG ADULT REFERENCE POPULATION

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Background: Mid-upper arm circumference (MUAC) is a widely recognized anthropometric tool, appreciated for its practicality, cost-effectiveness, and diagnostic accuracy in assessing nutritional deficiencies, muscle mass and body composition. In this study, we aimed to establish sex-specific MUAC cut-off values for the Turkish population to define optimal thresholds.
Material and methods: We included healthy young participants aged between 18 and 39 years and without chronic diseases or chronic drug use. MUAC was measured at the midpoint between the tip of the elbow (olecranon process) and the tip of the scapula (acromion process). MUAC cut-off points were calculated as two SDs below in each sex.
Results: There were 301 participants (187 male, 114 female; mean age: 26.5±4.6 years). Mean MUAC was 29.14±2.76 cm and 24.23±2.27 cm in males and females, respectively. The rounded cut-off values were calculated as 24 cm for males and 19 cm for females.
Conclusion: Our study reported MUAC cut offs derived from the Turkish reference group which can be used as a tool for the mussle mass assessment and nutrition status. However , these cut-off values need to be validated with further studies to prove their adequacy.
Keywords: mid upper arm circumference, cut-off, reference, thresholds

P1568

THE IMPACT OF OCCUPATIONAL ACTIVITY ON LUMBAR DISC DEGENERATION

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Introduction : Low back pain is a significant socio-professional health problem, responsible for 30 % of prolonged work absences in Europe **(1)**. Moreover, occupational activity plays a considerable role in the onset and progression of disc degeneration through mechanical overload associated with work, poor postures, inappropriate ergonomics, and microtrauma.
Objective : The aim of our study was to assess the relationship between occupational activity and the severity of disc degeneration on MRI in patients suffering from chronic low back pain.
Patients and Methods : We conducted a cross-sectional and analytical study over an 17-month period (December 2022-April

2024), including patients with low back pain lasting more than 3 months with degenerative disc disease on MRI. Sociodemographic, clinical, and radiological data were collected. The Oswestry Disability Index was used to assess functional impairment. The Pfirrmann classification was performed to categorize the severity of disc degeneration into three levels: mild (grades 1 and 2), moderate (grade 3), and severe (grades 4 and 5). A p-value < 0.05 was considered statistically significant.

Results : A total of 150 patients were included, with a median age of 48 years [24-71] and a sex ratio of 0.39 (48 males / 102 females). The mean pain Visual Analog Scale (VAS) score was 6 ± 1. The majority of patients had a middle socio-economic level (70.6%) and had attained either a university (52.7%) or secondary (37.3%) level of education. Workers represented 49.3% of the cases, while non-workers represented 42%, and retirees made up 8.7% of the cases. Among workers, 73% performed sedentary work, while 27% had manual labor jobs. Prolonged sitting posture was observed in 74% of cases, and prolonged standing posture in 36.4% of cases. Job dissatisfaction and/or stress was reported by 82% of workers. According to the Pfirrmann scale, being a worker was significantly correlated with the level of disc degeneration on MRI: the prevalence of severe degeneration (Pfirrmann > 3) was significantly higher among workers compared to non-workers (57.4% vs 42.6%, p = 0.02). The Oswestry Disability Index score was also significantly higher in workers (p < 0.01).

Discussion : In our study, occupational activity was significantly associated with the severity of disc degeneration on MRI and the degree of functional disability. In the literature, manual work requiring physical effort and the lifting of heavy loads, generating repeated microtrauma, has been identified as a factor contributing to the acceleration of degenerative damage to the lumbar spine **(2)**. However, studies have also shown that sedentary work is an important occupational factor implicated in the onset and aggravation of common low back pain **(3)**. In our series, patients with sedentary jobs represented the predominant category.

Conclusion : Our study demonstrated the significant impact of occupational activity on the progression and aggravation of lumbar disc degeneration. Professional assessment and patient education in the workplace should be part of the management strategy of these patients.

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P1569

METABOLIC SYNDROME IN CHRONIC INFLAMMATORY RHEUMATIC DISEASES

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Background : Rheumatoid arthritis (RA), ankylosing spondylitis (AS) and psoriatic arthritis (PsA) can promote the development of metabolic syndrome **(MetS)**, mainly through systemic inflammation, but also through commonly used drugs such as corticosteroids and non-steroidal anti-inflammatory drugs. **MetS** is defined by the presence of at least three of the following five criteria: abdominal obesity, hypertriglyceridaemia (≥ 1.7 mmol/L), low HDL cholesterol (< 1 mmol/L in men and < 1.3 mmol/L in women), arterial hypertension (≥ 130/85) and hyperglycaemia (> 5.6 mmol/L). It represents a major risk factor for cardiovascular events.

Objective : To assess the prevalence of **MetS** in inflammatory rheumatic diseases and to determine the factors associated with its occurrence.

Patients and Methods : We conducted a descriptive and analytical cross-sectional study including patients with chronic inflammatory rheumatic disease (RA, AS or PsA). Demographic data and clinico-biological characteristics of the disease were collected. RA activity was assessed by the DAS28 score. AS and PsA activity was assessed by the ASDAS score. All patients had measurements of weight, height, waist circumference, diastolic and systolic blood pressure, fasting blood glucose, cholesterol (total, HDL-C) and triglycerides.

Results : We included 150 patients in the study (105 RA, 45 AS, 40 PsA) with a mean age of 49.5 ± 9.7 years and a sex-ratio M/F of 0.62. The mean duration of disease was 22 months [3 months, 60 months]. RA was destructive and erosive in 71.4% and seropositive in 61.7% of cases. For AS, it was a strictly axial form in 63.6% and a mixed (axial and peripheral) form in 36.4% of cases. For PsA, the form was strictly peripheral in 57.5% and mixed (axial and peripheral) in 42.5% of cases. Coxitis was noted in 26.7% of cases. A biological inflammatory syndrome was noted in 62% of cases, with mean values for ESR (erythrocyte sedimentation rate) and CRP (C-reactive protein) of 51.5 ± 10.25 mm and 19.75 ± 7.25 mg/L, respectively. The mean DAS28 value in RA patients was 3.25 ± 1.55 with active disease in 78.7% of cases. The mean ASDAS value for AS and PsA patients was 3.11 ± 1.14, with active disease in 79.15% of cases. The mean BMI (body mass index) was 28.76 ± 6.8 kg/m2. The prevalence of **MetS** elements was as follows : abdominal obesity (35.3%, n=53), hyperglycemia (30.6%, n=46), hypertriglyceridemia (24%, n=36), low HDL-cholesterol (18.7%, n=28), arterial hypertension (38.6%, n=150). **MetS** (at least 3 out of 5 criteria) was reported in 32% (n=48). Smoking was reported in 23.3% (n=35) and alcohol in 13.3% (n=18). Hyperuricemia was noted in 24% (n=36). Liver ultrasound was performed in 32% of patients (n=48), and hepatic steatosis was found in 18.7% (n=9). A history of cardiovascular disease (myocardial infarction, embolic stroke etc.) was reported in 18% (n=27). The presence of

MetS was significantly associated with advanced age (p=0.04) and a longer duration of disease (p=0.42). No significant correlation was found with indices of disease activity or with levels of biological markers of inflammation.
Conclusion : Our study shows the high prevalence of **MetS**, hyperuricemia and cardiovascular risk in patients with inflammatory rheumatic diseases. Although previous studies have shown that **MetS** is mainly related to the systemic inflammation generated by these pathologies, our work has not documented a significant link between **MetS** and activity indices or with biological markers of inflammation.

P1570

ASSESSMENT OF EFFECTS OF HORMONAL AND BIOCHEMICAL CHANGES ON ONE YEAR BMD CHANGES IN THALASSEMIA MAJOR PATIENTS

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Objectives:
Low bone density is a known problem in thalassemia major patients. Disorders of thyroid, liver, glucose and ca metabolism that are also common in these patients, affect bone density changes. In this project we measured correlation between changes of these parameters in one year interval.
Material and methods:
In this study, 20 patients with thalassemia major were enrolled in the project. Bone density measurements were performed in the spine and femur twice, a year apart, using a densitometer device (Norland, XR-46). The results of TSH, fasting blood sugar, calcium, phosphorus, SGOT, SGPT tests at the times around these measurements were collected. The mean age of the participants was 17.3 ± 5 years (8-25 years). The ratio of male to female participants was 6/14. Bivariate correlation analysis was used to find correlation between changes in bone density and changes in laboratory variables. The correlation coefficient was used to examine the correlation between variables with normal distribution was Pearson and Spearman coefficient was used to examine correlation between variables that did not have a normal distribution. The variables were examined for normal distribution by Kolmogorov-Smirnova test.
Results:
Mean of changes of BMD in spine and femur was 0.0341 ± 0.056 and 0.005 ± 0.070, respectively. We found mean of changes of TSH, calcium, phosphorus, fasting blood sugar, SGOT, SGOT as -0.36 ± 1.50, -0.23 ± 1.37, 5.84 ± 14.60, -3.94 ± 10.63, -2.10 ± 13.09, respectively. No correlation observed between BMD changes and changes of laboratory results.
Conclusion:
It seems one year is not enough time to see the effects of hormonal, metabolic and hepatic parameters such as TSH, calcium, phosphorus, FBS, SGOT, SGOT changes on bone mineral density alterations.
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P1571

QUANTITATIVE EVALUATION OF MAGNETIC RESONANCE IMAGING IN THE EARLY DETECTION OF OSTEOPOROSIS

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Objectives: Osteoporosis is an asymptomatic disease, therefore, many patients, despite the need for body mass density (BMD) testing, do not undergo timely dual-energy X-ray absorptiometry (DEXA), examination and remain undiagnosed, while they may undergo magnetic resonance imaging (MRI) due to lumbar spine pain and osteoporosis-related complications. In addition to parameters from DEXA, we aimed to assess the use of quantitative M-score from MRI for early detection of osteoporosis and preliminary investigate the correlation between signal-to-noise ratio (SNR) and M-score from MRI versus TBS from DEXA.
Material and Methods: Five newly diagnosed osteoporotic women underwent densitometry examination using the *Hologic Discovery A (S/N 84182)* device to determine BMD, T-score and trabecular bone score (TBS) in the lumbar spine and subsequently MRI examination of the lumbar spine using a *Hitachi Oasis 1.2T MRI Scanner* to obtain SNR values from T1-weighted images for calculating a quantitative M-score. The reference group consisted of five young non-osteoporotic women.
Results: Spearman's Rho correlation calculator was preferred for evaluating correlations. Both SNR and M-score were negatively correlated with BMD [r = -0.300, p = 0.68] and with T-score [r = -0.36, p = 0.55]. A positive correlation was found between SNR/M-score versus TBS [r = 0.82, p = 0.089]. This only approached statistical significance, probably due to the fewer probands.
Conclusion: High-resolution MRI allows doctors to assess the quality of trabecular bone, providing insight into the disease's se-

verity. The study's interaction of imaging methods suggests that MRI could become a non-invasive opportunistic screening technique in the diagnosis and early treatment of osteoporosis.

P1572

OFF-TARGET EFFECTS OF TYROSINE-KINASE INHIBITORS IN PATIENTS WITH CHRONIC MYELOID LEUKEMIA

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Introduction: Thanks to modern tyrosine kinase inhibitors (TKIs), the survival rate of patients with chronic myeloid leukemia (CML) does not differ from the general population. Several off-target effects of these drugs, unrelated to their indications, have been described. Objective: We aimed to investigate the changes in bone metabolism, metabolic parameters, and body composition over the course of one year in CML patients undergoing TKI treatment. **Methods:** We investigated patients who were treated at our tertiary referral center for hematology in the Department of Internal Medicine and Oncology, Semmelweis University. In addition to collecting medical and treatment history, laboratory tests (metabolic parameters, calcium and bone metabolism parameters, hormone levels) were performed at baseline, and after 6 and 12 months. Osteodensitometry and total body composition measurements (GE Lunar Prodigy) were performed at the start of the study and one year later. **Results:** Data from 53 patients were analyzed (34 men, 19 women), with a mean age of 53±16 years. Almost half of the patients were on imatinib (49%), 19% on dasatinib, 17% on nilotinib, and 14% were receiving other treatments. At enrollment, 3/53 patients had osteoporosis, and 4/53 had osteopenia. During the one-year follow-up period, there was no significant change in spinal bone mineral density (BMD) (1.281±0.221 vs. 1.271±0.250 g/cm^2; p>0.1). However, femoral neck BMD decreased by 4.5% (1.044±0.133 vs. 0.997±0.172 g/cm^2; p=0.010), and total hip BMD decreased by 3.2% (1.095±0.143 vs. 1.060±0.143 g/cm^2; p=0.019). At the time of the baseline visit, the patients were obese (BMI: 30.9±7 kg/m^2), and this did not change significantly during the observation period. The average vitamin-D level of the patients at screening was close to the adequate range (29.6±12.3 ng/dl), although 47% had vitamin D deficiency, which was corrected in all cases. The albumin-corrected serum calcium level was 2.26±0.08 mmol/l, with mild hypocalcemia frequently observed. There were no manifest disturbances in carbohydrate metabolism, although atherogenic dyslipidemia was common. **Discussion:** In CML patients treated with tyrosine kinase inhibitors, the off-target effects of the drugs must also be monitored. During the observation period, there was no change in BMD at the spine, but decreases were observed at the total hip and femoral neck. Further follow-up of the patients is planned, and comparisons will be made to determine which effects may be attributed to the TKIs.

P1573

WEARABLE-BASED ACCELEROMETRY FEATURES AS A POTENTIAL DIGITAL BIOMARKER FOR IDENTIFYING FIBROMYALGIA PATIENTS THROUGH GAIT ASSESSMENT IN DUAL-TASK CONDITIONS

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Objective: To find the potential digital biomarker through accelerometry-based assessment of dinamic balance and gait in dual-task settings in FM patients.
Material and Methods: The 27 non-treated primary fibromyalgia (FM) patients (3 M, 24 F, 46,8±8.75 y) and 27 healthy age and gender matched subjects (HC) were recruited for this cross-sectional study. All participants were wearing 4 tri-axial accelerometers (X, Y, and Z axis): one over the L4-L5 junction (spine), over the right anterior superior iliac spine (hip) and both ankles. Patients' dinamic balance characteristics were assessed using a gait analysis accross four conditions (basic gait, with motor task, with mental task, with both). Raw data was sent through the Wi-Fi connection from accelerometers to the tablet and then to the central server for further analysis. After signal processing, time –, frequency – and step – domain features (Figure 1.) were analyzed and used for discrimination between FM and HC subjects. **Results:** Thirty different features are significant in distinguishing fibromyalgia (FM) from healthy controls (HC). Among these, most frequent were time-domain features: minRES (significant for all four sensors in three conditions), stdRES (four sensors and three conditions) and stdY (four sensors and four conditions), stdX and minmaxY (two sensors in two and three conditions). The other were frequency-domain feature hr3Z (significant for three sensors in three conditions) and stepdomain feature mean_amplitude (two sensors in three conditions). In terms of sensor placement, the key features were primarily captured by ankle and hip sensors. Dual-task conditions showed that the gait combined with either a mental or motor task (but not both) provided the most valuable information, while basic gait alone was less informative. **Conclusion:** The results indicate that the selected features could serve as potential digital biomarkers for identifying fibromyalgia patients during gait analysis. It appears that sensors placed on the feet and hip are more effective for data collection, with a clear advantage to using time-domain features. Regarding dual-task conditions, the findings showed that the optimal condition for analysis is adding a mental or motor task while walking to reveal any balance impairments. By combining foot-mounted sensors, the selected features, and dual-task conditions, this methodology could provide a fast and cost-effective way to assess the motor abilities of FM patients, potentially influencing diagnostic and therapeutic decisions while reducing the frequency of falls.

Figures:

Time – Domain Features	Calculation
SMA (signal mangitude area)	$SMA = \frac{1}{N}\sum_{i=1}^{N}(\lvert X_i\rvert + \lvert Y_i\rvert + \lvert Z_i\rvert)$
meanRES (mean value of resultant acceleration)	$meanRES = \frac{1}{N}\sum_{i=1}^{N}\sqrt{X_i^2 + Y_i^2 + Z_i^2}$
stdRES (standard deviation of resultant acceleration):	$stdRES = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}\left(\sqrt{X_i^2 + Y_i^2 + Z_i^2} - meanRES\right)^2}$
minmaxRES (difference between max and min of resultant acceleration):	$minmaxRES = \max(\sqrt{X_i^2 + Y_i^2 + Z_i^2}) - \min(\sqrt{X_i^2 + Y_i^2 + Z_i^2})$
stdX, stdY, stdZ (standard deviation in the X, Y and Z axis)	$stdX = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(X_i - \overline{X})^2}$ analogues for Y and Z
minmaxX, minmaxY, minmaxZ (difference between max and min in the X, Y and Z axis	$minmaxX = \max(X_i) - \min(X_i)$ analogues for Y and Z
Frequency – Domain Features	**Calculation**
harmonicsratioX, harmonicsratioY, harmonicsratioZ, harmonicsratioRES (ratio between first 4 harmonics and total spectrum in X, Y, and Z axis and resultant acceleration)	$harmonicsratioX = \frac{\sum_{k=1}^{4}\lvert H_k\rvert}{\sum_{k=1}^{N}\lvert H_k\rvert}$ analogues for Y , Z and RES
hr1X, hr2X, hr3X, hr4X; hr1Y, hr2Y, hr3Y, hr4Y; hr1Z, hr2Z, hr3Z, hr4Z; hr1RES, hr2RES, hr3RES, hr4RES (part of each harmonics (from 1 to 4) in total spectrum and resultant acceleration)	$hr1X = \frac{\lvert H_1\rvert}{\sum_{k=1}^{N}\lvert H_k\rvert}$ analogues for other harmonics and axis
Step – Domain Features	**Calculation**
mean_step_time (mean step time)	$mean\_step\_time = \frac{1}{N-1}\sum_{i=1}^{N-1}(t_{i+1} - t_i)$
std_step_time (standard deviation of step time)	$std\_step\_time = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N-1}((t_{i+1} - t_i) - mean\_step\_time)^2}$
asymmetry1 (assymetry of step time):	$asymmetry1 = \frac{\sum_{i=1}^{N-1}\lvert(t_{i+1} - t_i) - (t_i - t_{i-1})\rvert}{N-1}$
mean_amplitude (mean amplitude of step)	$mean\_amplitude = \frac{1}{N}\sum_{i=1}^{N}(A_{max} - A_{min})$
std_amplitudes (standard deviation of step amplitudes	$std\_amplitudes = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}((A_{max} - A_{min}) - mean\_amplitude)^2}$
asymmetry2 (assymetry of step amplitude):	$asymmetry2 = \frac{\sum_{i=1}^{N-1}\lvert(A_{max_{i+1}} - A_{min_{i+1}}) - (A_{max_i} - A_{min_i})\rvert}{N-1}$

Figure 1. Time- , frequency- and step-domain features used for analysis

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SURGICAL CORRECTION OF THE LIMB LENGTH DISCREPANCY AND SOME CLINICAL AND DUPLEX ANGIOSCANNING DEPENDENCIES IN CONGENITAL VASCULAR MALFORMATIONS

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Summary: Congenital vascular malformations (CVM) are the cause of the limb length discrepancy (LLD) and geodynamic disorders in children, which requires correction Methods. We observed 10 children with CVM who undergo surgical treatment: 6 patients with arteriovenous (AVM); 2 – with venosum form (VM); 2 - with kapilar fom (KM). The average age of patients was 9.8±2.5 years. Lengthening of the affected limb was noted in 8 patients; in 2 patients - shortening. Performed: long standing X-rays of the lower legs to assess LLD; color duplex angioscanning (CDA) of arteries lower extremities and to establish their influence on the formation LLD in pediatric patients with CVM. indication for surgical treatment was LLD over 2 cm. In 8 patients with lengthening of the affected limb, epiphisiodesis of the distal femur and proximal tibia was performed: in 7 - with eight plates; one has screws. Results. The existence of a statistically significant relationship between the increase in the linear velocity of blood circulation of the femur and the LLD of the femur was established - r=0.975; the inverse relationship between the increase in resistance of the femur and the resistance of the posterior tibial artery and the increase in LLD of the tibia, r=-0.898 and r=-0.900 (Spearman's rank correlation coefficient). According to color duplex angioscanning (CDA) results the presence of a conglomerate of vessels in soft tissues with a diameter of more than 2.0 mm; the linear speed of blood flow in vessels over 0.2 m/s was considered a contraindication to surgical treatment. The average total LLD before treatment was 4.4±2.2 cm, after - 1.5±1.3 cm, LLD correction was 2.6±1.7 cm (p=0.011), which indicates a significant reduction of LLD . Changes in LLD of the femur and tibia were also statistically significant. Reduction of LLD for the tibia- 1.5±1.0 cm, p=0.017 (from 2.8±1.6 to 1.3±1.1 cm). The dynamics of the femur LLD - 1.1±0.8 cm, p=0.012 (from 1.3±0.8 to 0.4±0.4 cm). The average rate of recovery was 1.6±0.7 cm per year. Surgical intervention did not cause progression in any case. The duration of treatment and observation was 18+7.9 months. Conclusions. Some reliable correlations were established between hemodynamic disturbance of the affected limb and its elongation; the effectiveness of theepiphisiodesis of the distal femur and proximal tibia to correct LLD in patients with CVM has been proven. The degree of hemodynamic disturbances is the main factor to determining the possibility to perform surgical correction LLD in patients with CVM.

P1575

CONTRIBUTION OF MINERAL-BONE DISORDERS OF CHRONIC KIDNEY DISEASE TO JAW BONE FRAGILITY OF INDIVIDUALS WITH HIGH-EXCHANGE OSTEOPOROSIS ON OUTPATIENT HEMODIALYSIS

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Objectives: To evaluate the severity of osteoporosis (OP) with high bone metabolism in patients with terminal stage of chronic kidney disease (CKD) on outpatient hemodialysis. Bone strength is known to be determined by bone quantity and quality. The latter encompasses factors affecting the structural and material properties of bone, both of which are mainly dependent on bone tissue renewal. All these components are controlled by remodeling and any modification of one of them leads to bone fragility. In OP, the volume of resorbed bone increases. An imbalance in the volume of resorbed and formed bone jeopardizes bone structure. The most informative biochemical parameters of bone tissue repair monitoring - markers of osteogenesis - were studied.

Materials and Methods: Thirty-five mature women who had already suffered from idiopathic OD at the time of referral to an implantologist for dental implant surgery were examined. The marker of bone formation - ostase in venous blood and the marker of resorption - deoxypyridinoline/creatinine (DP/Cr) in morning urine of patients at the G2 stage of CHD were studied twice with an interval from 3 to 4 weeks for the purpose of laboratory diagnostics of osteoporotic changes. Similar values were obtained in 12 patients with chronic kidney disease-mineral-bone disorders (CKD-MKN) and OP, with minor traumatic fractures at stage G5g of CKD (received outpatient hemodialysis 3 times a week). Low exchange variants of renal osteodystrophy in those on hemodialysis were excluded by high parathyroid hormone and bone alkaline phosphatase values.

Results: The incremental rate of ostase in patients at stage G2 of CKD was virtually indistinguishable from that in patients at stage G 5 of CKD. The rate of DP\Kr increment in stage G5 CKD, was not significantly higher than in stage G2 CKD, (p 0.05). The contribution of mineral-bone abnormalities of CBP to bone fragility in patients with prior renal disease idiopathic OP and diagnosed OP with high metabolism was not significant.

Conclusion: Bone metabolism is one of the determinants of bone quality. A better knowledge of the importance of different factors determining bone quality (intrinsic properties of bone matrix, bone architecture, etc.) will improve the understanding of the pathogenesis of brittle bone in patients with pre-existing renal disease and diagnosed OP.

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BONE TURNOVER IN POSTMENOPAUSAL WOMEN: EVALUATING THE IMPACT OF ESTETROL (E4) FROM A RANDOMIZED PLACEBO-CONTROLLED PHASE 3 TRIAL

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Objective

Estetrol (E4) is a naturally occuring estrogen effective in reducing menopausal vasomotor symptoms (VMS) with minimal impact on hemostasis and potential metabolic benefits. Estrogen therapy alleviates moderate to severe VMS and helps counteract menopause-related bone turnover acceleration. A Phase 2 study previously showed E4 15 mg reduces bone turnover biomarkers, suggesting a beneficial effect. This Phase 3 study assesses E4 impact on these markers after 12 and 52 weeks in postmenopausal (PM) women.

Design

E4Comfort II (NCT04090957) was a double-blind, placebo-controlled, multicenter trial conducted at 122 US and Canadian sites to evaluate E4 efficacy and safety for treating moderate-to-severe VMS in PM women aged 40–65. A total of 579 participants received E4 15 mg (n=192), E4 20 mg (n=193), or placebo (n=194) once daily for 52 weeks. Blood samples were collected at baseline, week 12 (W12), and week 52 (W52) for CTX-1, P1NP, calcium, and vitamin D analysis. Mixed Model Repeated Measures was used for statistical comparisons ($p<0.05$ significant).

Results

CTX-1 significantly decreased with E4 vs. placebo at W12 and W52 (all $p<0.0001$). P1NP levels also declined significantly at W12 ($p=0.0220$ for 15 mg; $p<0.0001$ for 20 mg) and W52 (all $p<0.0001$). Calcium decreased significantly vs. placebo at W12 ($p=0.0004$ for 15 mg; $p<0.0001$ for 20 mg) and at W52 for 20 mg ($p<0.0001$). No significant vitamin D changes were observed.

Conclusion

E4 reduces CTX-1 and P1NP, indicating lower bone turnover, suggesting a beneficial role in maintaining bone strength and potentially preventing osteoporosis in postmenopausal women.

Table 1. Change from Baseline to Week 12 and Week 52 for Bone Turnover Biomarkers

Bone markers	E4 15 mg (N = 192)		E4 20 mg (N = 193)		Placebo (N = 194)
	LS mean CFB (95% CI)	*p*-value (vs placebo)	LS mean CFB (95% CI)	*p*-value (vs placebo)	LS mean CFB (95% CI)
CTX-1 (µg/L)					
W12	-0.15 (-0.18, -0.12)	**<.0001**	-0.15 (-0.19, -0.12)	**<.0001**	-0.02 (-0.05, 0.01)
W52	-0.19 (-0.22, -0.15)	**<.0001**	-0.16 (-0.20, -0.12)	**<.0001**	-0.02 (-0.05, 0.02)
PINP (µg/L)					
W12	-8.45 (-11.99, -4.91)	**0.0220**	-13.84 (-17.40, -10.27)	**<.0001**	-2.22 (-5.71, 1.26)
W52	-16.08 (-20.57, -11.59)	**<.0001**	-13.83 (-18.63, -9.03)	**<.0001**	-0.15 (-4.34, 4.04)
Calcium (mmol/L)					
W12	-0.04 (-0.06, -0.03)	**0.0004**	-0.08 (-0.09, -0.06)	**<.0001**	0.00 (-0.02, 0.02)
W52	-0.07 (-0.09, -0.04)	0.0898	-0.11 (-0.13, -0.08)	**<.0001**	-0.04 (-0.06, -0.02)
Vitamin D (nmol/L)					
W12	2.37 (-1.92, 6.66)	0.7531	-2.19 (-6.46, 2.07)	0.5548	0.51 (-3.66, 4.67)
W52	13.89 (8.44, 19.33)	0.1170	5.52 (-0.29, 11.34)	0.885	7.07 (1.97, 12.17)

LS: Least Squares

Source of funding: The study was funded by Estetra SRL, Belgium, a wholly owned company of Gedeon Richter PLC, Liège.

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EARLY CLINICAL DEVELOPMENT OF COMBINATION DRUG CANDIDATE RJX-01 FOR THE TREATMENT OF SARCOPENIA

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Objective

The novel combination drug candidate RJx-01 was shown to exert beneficial synergistic effects on muscle strength and physical performance in preclinical studies. It was proposed to evaluate the potential of RJx-01 in human clinical trials as a therapeutic intervention for sarcopenia.

Material and Methods

A Phase 1 study was conducted in 42 healthy men (65-75 years old) during and after 2 weeks of muscle inactivity (immobilization by leg casting) to assess the tolerability, safety and effect on muscle strength of 6 weeks daily treatment with RJx-01.

Results

In healthy elderly volunteers, 6 weeks of RJx-01 treatment was safe and well tolerated. Compared to placebo-treated subjects (n=21), RJx-01 treatment (n=21) induced faster and better recovery of muscle strength in the leg after 2 weeks of immobilization (isometric analysis). During isokinetic measurements, RJx-01 treatment showed significantly improved muscle function (rate of velocity development) and resistance to muscle fatigue in the casted leg.

We then designed a Phase 2 study to evaluate the safety and effects of longer term (6 months) treatment with RJx-01 on muscle integrity in elderly COPD patients. Unplanned hospitalization for severe acute exacerbation is a major event for COPD patients and the associated disability can lead to significant functional decline. The skeletal muscle dysfunction seen in COPD is part of the spectrum seen in sarcopenia. We hypothesize that RJx-01 treatment may have beneficial effects on functional performance of these patients.

Conclusion

Following a Phase 1 study showing initial evidence of safety and efficacy of RJx-01 in an acute sarcopenia model, a Phase 2 program was initiated. A first study will assess the longer-term response to RJx-01 treatment in COPD patients at risk of developing chronic sarcopenia. Additional Phase 2 studies in other patient populations where sarcopenia has a significant impact on disease burden are being considered.

Disclosures

All co-authors were employed or funded by Rejuvenate Biomed.

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ONLINE ACCESS TO NOGG GUIDELINES IN 2024; INTERACTION WITH FRAX AND INTERNATIONAL VISIBILITY

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The UK National Osteoporosis Guideline Group published updated guidance for the Prevention and Treatment of Osteoporosis in 2021. The guideline aims to provide clinically appropriate recommendations by integrating available evidence on clinical efficacy, effectiveness and safety. It is intended for use by all healthcare professionals involved in the prevention and treatment of osteoporosis and fragility fractures, including primary care practitioners, allied health professionals and relevant specialists in secondary care. The guideline is provided in full on the NOGG website (https://www.nogg.org.uk/) which permits audit of online access to the website by users. We aimed to audit website views and users over the period 1st January-31st December 2024.

In 2024, the NOGG website had a total of 936,217 views, a single view being a page on the website being seen by a visitor. Of these views, the majority (625,498, 66.8%) were views arising after calculated FRAX 10-year probabilities, with the user being sent directly from the UK FRAX website to the NOGG Guideline website. Most of these FRAX-based views (62.0%) were calculations conducted without femoral neck BMD input, suggesting FRAX was being used to determine the need for DXA assessment and/or treatment. Of the other pages viewed, the NOGG home page was the most viewed (70,426 times) followed by the Full Guideline page (46,857 views). Views showed a classical 5-day working week pattern, with an average of 3,601 views per working day (Figure-1). Over the year, a total of 781,643 users accessed the website; as expected, most users were based in the UK (685,427, 87.7%), but users were also documented in at least 57 other countries, with the top 3 countries being Ireland (2.3% of users), Brazil (1.7%) and the USA (1.3%).

This audit demonstrates very active use of the NOGG website. The use is largely driven by the direct link between the FRAX UK tool and the NOGG website, a facility that only exists for a small number of countries currently but can easily be set-up for other countries. The NOGG website and guideline has very good international visibility and engagement; it provides a suitable guideline template that other countries could contextually adapt.

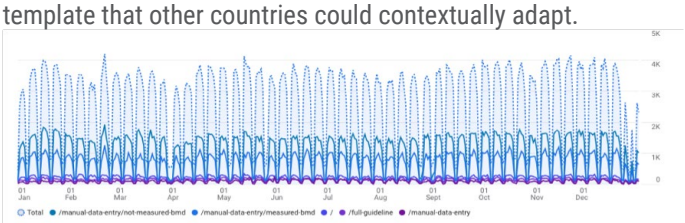

Figure 1 Views by page path and screen class over time. Total views in 2024 = 936,217

P1579

GLP-1 RECEPTOR AGONISTS AND RISK OF BONE FRACTURES IN ELDERLY PEOPLE WITH TYPE 2 DIABETES

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Objective: To assess the risk of fractures associated with glucagon-like peptide 1 receptor agonists (GLP-1 RA) therapy compared to sodium-glucose cotransporter-2 inhibitors (SGLT-2i) or dipeptidyl peptidase-4 inhibitors (DPP-4i) therapy in elderly people with type 2 diabetes.

Methods: This nationwide, population-based, cohort study included individuals with type 2 diabetes, ≥ 65 years, who initiated GLP-1 RA therapy or one of the comparators during January 2018–October 2022. The primary outcome was the first incident of vertebral, hip, pelvic, humerus, forearm or rib fracture. Anthropometric and clinical characteristics of patients, including osteoporosis and risk factors for fractures, were extracted from the electronic database. People were followed until fracture, death, or March 2024. After adjusting for propensity score, hazard ratios (HRs) with 95% confidence interval (CI) were estimated using stepwise Cox models, and the Fine-Gray model for competing risks. Subgroup analyses by age, sex, ethnicity, BMI, and osteoporosis were performed.

Results: Among 45,222 people, 73.0±6.4 years, 50% female, 66.5% were 65-75 years and 31.3% ≥75 years. During a median follow up of 35.3 (interquartile range 24.7-48.0) months, 3,618 (8.0%) had an incident fracture. Among 11,061 new users of GLP-1 RA and 34,161 of the comparator drugs, the overall incidence of fractures was comparable between groups ((2.82 (95%CI 2.63-3.02) vs. 2.75 (95%CI 2.65-2.85)), p=0.53, respectively, per 100 person years. In multivariate analysis for osteoporotic fractures (adjusted for multiple risk factors), initiating GLP-1 RA was associated with a 12% increased risk for bone fractures compared to the control group (HR 1.12, 95%CI 1.03-1.23, p=0.006). Repeating the analysis for competing risks, along with conducting various subgroup and sensitivity analyses, yielded results consistent with those of the main analysis.

Conclusions: Initiation of GLP-1 RA therapy was associated with an increased risk of incident fractures compared to SGLT-2i and DPP-4i, among elderly individuals with type 2 diabetes.

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WORLD CONGRESS ON OSTEOPOROSIS, OSTEOARTHRITIS AND MUSCULOSKELETAL DISEASES

Abstract Book

Sponsored Sessions Abstracts

SY1

RESTORING BONE STRENGTH: IT TAKES TWO TO DANCE A TANGO

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Restoring optimal bone strength requires a coordinated approach on both components of bone fragility, i.e. stopping the accelerated decay of bone mass and structure and rebuilding new bone—much like a well-executed tango. This symposium, co-chaired by esteemed experts Dr. Serge Ferrari (Geneva University Hospital, Geneva, Switzerland) and Dr. Salvatore Minisola (Sapienza Rome University, Italy), will explore the harmonious interplay between anabolic and anti-resorptive therapies in managing bone fragility. Dr. Serge Ferrari will set the stage by examining the roles of bone modelling and remodelling in both healthy bone and osteoporosis, highlighting their critical contributions to bone health and the mechanisms underlying bone fragility. He will then explore how anti-resorptives and bone-forming agents influence both bone modelling and remodelling, and bone microstructure.

Building on this, Dr. Benjamin Leder (Massachusetts General Hospital, United States) will draw from his extensive hands-on experience, having conducted some of the key studies on sequential and combination therapies. He will demonstrate how these therapeutic approaches translate into clinical benefits, offering a dynamic strategy for optimising patient outcomes. He will assess the comparative efficacy of various anabolic/anti-resorptive combination approaches in treating postmenopausal osteoporosis and highlight the unique properties of specific sequential treatment regimens, detailing their effects on bone mineral density, microarchitecture, and strength.

This session offers a unique opportunity to uncover the dynamic partnership between these therapeutic approaches, providing attendees with valuable insights into advancing osteoporosis care.

This satellite symposium is funded and organised by Gedeon Richter Plc. and is intended for Healthcare Professionals only.

SY2

UCB-SPONSORED SATELLITE SYMPOSIUM

U. C. B. Ucb[1]

[1]UCB, Brussels, Belgium

Romosozumab: Right Patient, Right Time

The introduction of anabolic therapies has represented a shift in osteoporosis care, transforming the potential of early and effective treatment in fracture risk reduction[1,2]

Despite being highly prevalent, osteoporosis remains significantly undertreated, particularly in postmenopausal patients at very high fracture risk (VHFR).[3] Following an initial fracture, these patients may feel robbed of their independence, fearful of another fracture.[3,4] Approximately half of all subsequent fractures occur within 2 years of a major osteoporotic fracture – a universal criterion for VHFR – underscoring the urgent need for rapid bone formation in this population.[2,5]

In this interactive session, leading experts will uncover how, through its ability to build bone rapidly, romosozumab can reduce fracture risk amongst postmenopausal patients at VHFR.[1,5–7] They will also explore how efficient and timely intervention can help to optimise romosozumab's use in clinical practice.[1,2,6]

A Defining Era in Osteoporosis Management

Professor Salvatore Minisola (Sapienza University of Rome, Italy)

Opening the symposium, Professor Salvatore Minisola will reflect on the pioneering advancements within postmenopausal osteoporosis (PMO) care over the past decade, highlighting the established shift in guidelines towards prioritising bone formation in patients at VHFR.[1,2]

Rethinking Bone Building with Romosozumab

Dr Lothar Seefried (University Hospital at the Julius-Maximilians-University Würzburg, Germany)

Dr Lothar Seefried will begin by providing a visual summary of the mechanistic differences among current osteoporosis therapies. Considering outcomes beyond bone density is important when selecting a treatment, as structural weakening and increased porosity of the bone independently contribute to fracture risk, even with improved bone mass.[3,7,8]

Dr Seefried will demonstrate how romosozumab, through its action on sclerostin, rapidly increases bone formation whilst decreasing bone resorption, concluding by describing how this dual-effect mechanism translates into positive effects on bone structure and strength at both the trabecular and cortical level.[1,7]

Optimising Outcomes with Romosozumab First

Professor Kassim Javaid (University of Oxford, UK)

Professor Kassim Javaid will examine the wealth of evidence supporting the use of romosozumab as a valuable and effective treatment option for women with PMO at VHFR.[1,2,6] Utilising key clinical data, Professor Javaid will provide insights into romosozumab's clinical profile, focusing on crucial aspects of efficacy and tolerability.[1,6] He will also explore how first-line use of romosozumab can help to enhance outcomes for patients who have recently suffered a fracture.[2,5,6]

Recognising the Opportunity with Romosozumab

Professor Bente Langdahl (Aarhus University Hospital, Denmark)

Professor Bente Langdahl will lead a case-based presentation focusing on the practical application of romosozumab in clinical practice. She will describe the key characteristics that can help identify patients who may benefit from romosozumab, offering strategies to augment clinical decision-making and deliver optimal care for VHFR patients.[2]

Drawing on real-world insights gathered since romosozumab's launch in 2019, [9] Professor Langdahl will showcase the clinical reality of the outcomes seen following romosozumab treatment, touching on the importance of continued follow-on antiresorptive therapy and discussing how to effectively assess and manage cardiovascular risk.[1]

Looking to a Stronger Future

Following a stimulating Q&A, Professor Minisola will close the symposium by looking ahead to the future, considering the steps to take to ensure that the right patient receives the right care at the right time.

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In the EU, romosozumab is indicated in treatment of severe osteoporosis in postmenopausal women at high risk of fracture.[1]

Romosozumab Prescribing Information (PI) is available at booths 22–25. Licenses may vary by country. Please always refer to the PI in your country before prescribing any drug.
Adverse events should be reported. Reporting forms and information can be obtained from your local regulatory authority. Adverse events should also be reported to UCB.
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SY3

RISING OA INCIDENCE: EARLY INTERVENTION AND SYSADOAS FOR EFFECTIVE MANAGEMENT

N. Fuggle[1]

[1]Associate Professor of Rheumatology at the MRC Lifecourse Epidemiology Centre, University of Southampton, Southampton, United Kingdom

Osteoarthritis (OA) is a growing global concern, with over 595 million individuals affected worldwide in 2020. The early stages of osteoarthritis provide a potential window of opportunity to change the disease trajectory and improve quality of life. For this reason, early diagnosis allows timely disease management and burden reduction.
Dr. Fuggle's presentation will focus on the role of symptomatic slow-acting drugs for osteoarthritis (SYSADOAs) as an effective and safe therapy for improved management of knee OA. Attention will be paid to the key efficacy and safety data for these treatments, which form an important part of the ESCEO guidelines for the management of osteoarthritis.

SY4

FROM PAIN TO PRECISION: CHOOSING AN NSAID FOR OSTEOARTHRITIS MANAGEMENT

E. Choy[1]

[1]Head of Rheumatology and Translational Research at the Division of Infection and Immunity and Director of the Cardiff Regional Experimental Arthritis Treatment and Evaluation (CREATE) Centre at Cardiff University School of Medicine, Cardiff, Wales, United Kingdom

Non-steroidal anti-inflammatory drugs (NSAIDs) are among the most frequently prescribed drugs, and broadly recommended by international guidelines as a pharmacological option for the symptomatic relief of osteoarthritis. Medicines in this drug class are divided into two groups: COX-2 selective agents and non-selective agents that inhibit both the COX-2 and COX-1 isoforms. Professor Choy's presentation will focus on an update on the management of osteoarthritis and inflammation, overview of international guidelines and the role of COX-2 inhibitors in treating pain effectively with a consideration on safety data highlighting the PRECISION outcomes. PRECISION was the first study to look at long-term CV safety of NSAIDs in over 24,000 OA patients at high CV risk.

SY5

INTEGRATING MULTIMODAL APPROACHES FOR COMPREHENSIVE OA MANAGEMENT

J. J. Lichauco[1]

[1]Section Chief of Rheumatology at St. Luke's Medical Center and Past President of Philippine Rheumatology Association, Manila, Philippines

Osteoarthritis (OA) is generally a progressive degenerative condition, with different stages of severity, whose management requires long-term pharmacological and non-pharmacological options. OA related pain has a detrimental effect, impacting overall quality of life, from sleep disturbance to reduction of social and leisure activities. In advanced stages, with moderate to severe pain, a single therapeutical option may not be enough to reduce symptoms and improve wellbeing.
Dr Lichauco's presentation will focus on multimodal, multicomponent, multidisciplinary approaches, as the best solution at present to manage osteoarthritis disease. He will analyze the current pharmacological options with a focus on the

standardized care protocols adopted in the Philippines such as the shared decision-making process, a key component of patient-centered multidisciplinary approach, where clinical evidence and the patient's preference are considered.
A further project adopted in St Luke's Medical center is the rheumatology skilled nurse program. In the actual clinical practice nurses play an important role within the rheumatology multidisciplinary team. Nurses are providers of self-care support, patient education and assessment, treatment and disease monitoring with follow-up care, enhancing OA care and treatment consistency.

SY6

INTRODUCTION OF A CHEST X-RAY BASED OPPORTUNISTIC OSTEOPOROSIS SCREENING AI SOLUTION

D. Sunghyun Jung[1]

[1]Promedius Inc., Seoul, South Korea

The early diagnosis of osteoporosis has become a globally significant concern, particularly in the context of promoting healthy aging. This presentation introduces an advanced artificial intelligence (AI) solution developed for enhanced osteoporosis screening, leveraging chest X-ray imaging. We will outline the development process of this AI solution and present the results of its performance validation using both domestic and international datasets. Furthermore, we will discuss ongoing initiatives and notable achievements aimed at facilitating the successful market adoption of this innovative technology.

SY7

COST-EFFECTIVENESS ANALYSIS OF OPPORTUNISTIC OSTEOPOROSIS SCREENING USING CHEST X-RAY

M. Hiligsmann[1]

[1]Maastricht University, Maastricht, Netherlands

Recent advances have demonstrated that deep learning models applied to chest radiographs can effectively support opportunistic osteoporosis screening, offering a novel approach to identifying individuals at risk of fractures. However, the costs associated with implementing this strategy underscore the importance of assessing its cost-effectiveness. This lecture presents the results of unpublished economic evaluations comparing opportunistic screening via chest radiographs with deep learning, followed by treatment, versus no screening and treatment.
These studies were conducted in three countries with diverse healthcare settings and osteoporosis guidelines: the United States, Germany, and Japan. In each country, national clinical experts were integral to the study process, providing input on data collection and validating assumptions to ensure the relevance and accuracy of the analyses. Across all settings, the incremental cost-effectiveness ratio for screening women aged 50 years and over was consistently below established cost-effectiveness thresholds, demonstrating the economic viability of this strategy. Scenario analyses revealed that cost-effectiveness could be further improved, and even lead to dominance (lower costs for better health outcomes), by optimizing follow-up pathways and improving medication adherence, making these critical priorities in policy decision-making. Drug costs, treatment efficacy and fracture incidence also emerged as important drivers of cost-effectiveness. Additionally, sensitivity analyses showed that even after adjusting key parameters, the results remained favorable and demonstrated robustness.
These findings indicate that opportunistic osteoporosis screening via chest radiographs with deep learning represents a highly cost-effective intervention across diverse healthcare systems. By complementing existing osteoporosis management strategies, this innovative approach could play a pivotal role in reducing fracture rates, improving health outcomes, and mitigating the societal burden of osteoporosis.

SY8

JOURNEY TO FIND OPTIMAL FRACTURE RISK PREDICTION MODEL BASED ON CHEST X-RAYS

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Fragility fractures are a growing healthcare concern, particularly in aging societies. Current tools like DXA (dual-energy X-ray absorptiometry), have limitations in accessibility and predictive accuracy. To address these challenges, we propose an innovative approach leveraging artificial intelligence (AI) to predict fracture risk using standard chest radiographs (Chest PA), which are widely available in routine clinical settings.
The series of studies that I would like to introduce today aimed to develop and validate an AI model capable of estimating fracture risk with enhanced accessibility and comparable predictive performance compared to conventional methods. We utilized a comprehensive dataset of over 72,000 patients who underwent both DXA and chest radiography at three major medical centers. Our approach incorporates clinical data, such as fracture history, surgical records, and imaging outcomes, alongside chest PA to train and evaluate the model.
Key methodologies include preprocessing techniques, ensemble modeling, and survival curve analysis to predict fracture-free intervals. Preliminary results demonstrate that our AI model achieves superior predictive performance when added to FRAX, with the additional benefit of utilizing widely performed imaging modalities.
This study highlights the potential of integrating AI with conventional imaging to enable opportunistic screening, reduce healthcare costs, and improve patient outcomes. By harnessing additional information beyond bone density, this AI-based model bridges the gap in fracture risk prediction, offering a scalable and accessible solution for early intervention in high-risk populations. Our findings emphasize the transformative potential of AI in

reshaping osteoporosis care and fracture prevention strategies. We invite you all for discussions on the clinical implications and opportunities for broader adoption of this innovative approach.

SY9

REMS IN THE FRACTURE SETTING

A. Kurth[1]

[1]Orthopaedic Institute Dr. Baron&Colleagues and Goethe University Frankfurt, Frankfurt/Main, Germany

In clinical practice, REMS (Radiofrequency Echographic Multi Spectrometry) has potential applicability in secondary fracture prevention, particularly within the frameworks of Fracture Liaison Services (FLS) or Orthogeriatric services. The portable nature of REMS makes it particularly suitable for frail inpatients who may struggle to position themselves appropriately for DXA scans of the spine or hip. REMS can be conducted at the bedside, enabling rapid assessment of bone mineral density (BMD) in the immediate post-fracture period. This capability allows for timely, BMD-informed decisions regarding optimal orthopedic interventions and risk stratification, which can guide the prescription of anti-osteoporosis treatments (both anti-resorptive and bone-forming agents). Furthermore, REMS may play a crucial role in assessing BMD during initial fracture presentations in the Emergency Department, thereby facilitating more efficient Fracture Liaison Service management and addressing a critical gap in fracture prevention strategies.

SY10

REMS SUITABILITY IN SECONDARY OSTEOPOROSIS

G. Adami[1]

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Objective(s):
Secondary osteoporosis is a significant clinical challenge, often associated with chronic diseases or treatments that affect bone health. Notably, secondary osteoporosis affects 66% of older men, over 50% of premenopausal women and 30% of postmenopausal women. Secondary osteoporosis predisposes patients to fragility fractures, which can further worsen their condition. In this context, effective and safe diagnostic tools are essential for managing various patient populations, including those who cannot undergo radiation-based assessments. This study aims to evaluate the suitability of Radiofrequency Echographic Multi Spectrometry (REMS) in secondary osteoporosis diagnosis and monitoring, highlighting its advantages over conventional imaging techniques.
Material and Methods:
A systematic literature review was conducted to evaluate the clinical performance of REMS in assessing bone health in patients affected by secondary osteoporosis. Relevant studies were identified through searches in peer-reviewed databases, focusing on comparisons between REMS and standard diagnostic methods such as dual-energy X-ray absorptiometry (DXA).
Results:
Different disorders negatively impact bone health. Pregnancy and certain therapies can also cause secondary osteoporosis and increase fracture risk. REMS technology provides a radiation-free, non-invasive method to assess bone health via lumbar spine and femoral ultrasound scans. By measuring key parameters such as Bone Mineral Density (BMD), T-Score, and Fragility Score, REMS offers valuable insights into bone health and fragility. Recently published clinical studies have shown REMS's diagnostic accuracy in secondary osteoporosis. For instance, in patients undergoing peritoneal dialysis, REMS is not influenced by aortic calcification artifacts that artificially elevate lumbar BMD in DXA scans. Furthermore, in kidney transplant recipients, REMS demonstrates superior performance to DXA in the early detection of osteoporosis. Notably, in patients with type 2 diabetes—who exhibit a 'paradoxical situation' with normal BMD values but an increased fracture risk due to microarchitectural deterioration—REMS accurately revealed their true bone health status.
Conclusion(s):
REMS technology represents a significant advancement in the diagnosis and monitoring of secondary osteoporosis, offering a radiation-free, non-invasive alternative to traditional methods like DXA. Its demonstrated diagnostic accuracy across several conditions, including metabolic, renal, and nutritional disorders, as well as its ability to detect microarchitectural deterioration inchallenging cases like type 2 diabetes mellitus, underscores its potential as a valuable tool for improving bone health assessment and patient management.

SY11

BONE HEALTH MANAGEMENT IN PREGNANCY

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Objective(s):
Pregnancy induces significant physiological changes in maternal bone metabolism to meet the calcium demands of the developing fetus. The development of the fetal skeleton requires a substantial transfer of calcium from the mother to the fetus throughout pregnancy, with 80% of this transfer occurring during the third trimester. These changes, while typically reversible after breastfeeding weaning, can lead to complications such as bone loss or fractures, including pregnancy-associated osteoporosis. This study aims to evaluate the efficacy of Radiofrequency Echographic Multi Spectrometry (REMS) as a safe and effective tool for assessing and managing bone health during pregnancy, focusing on femoral neck assessments and addressing the limitations of conventional methods.
Material and Methods:
A systematic review of current literature was conducted to analyse the usefulness of REMS technology in monitoring bone health during pregnancy. The review focused on published studies evaluating REMS-derived parameters, such as bone mineral density (BMD) measured at the femoral neck, during pregnancy.

Results:
The maternal skeleton acts as the primary calcium reservoir for the developing fetus, potentially leading to maternal bone deterioration. Monitoring bone health during pregnancy is critical. Traditional methods, such as DXA, assess bone density but involve ionizing radiation, making them unsuitable during pregnancy. Typically, DXA evaluations are conducted before or after pregnancy, limiting early diagnostics and intervention. In contrast, REMS technology, using ultrasound, offers a radiation-free, non-invasive alternative with no negative effects on the fetus. Thanks to ts high precision, REMS allows continuous monitoring during pregnancy. An important REMS study allowed, for the first time, the identification of BMD changes between the first and third trimesters, revealing an average 2.0% decrease. Additionally, by using REMS for the assessment of BMD in the third trimester, an 8.1% decrease compared to non-pregnant women was found.
Conclusion(s):
REMS offers a safe and non-invasive approach for measuring bone mineral density during pregnancy, overcoming the limitations of conventional techniques like DXA. The technology enables continuous monitoring of maternal bone health, crucial for early detecting pregnancy-related bone loss without posing risks to the fetus.

SY12
ECONOMIC BENEFITS OF REMS

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Radiofrequency Echographic Multi-Spectrometry (REMS) is an innovative, non-ionizing diagnostic technique that has demonstrated high accuracy and precision, positioning it as a promising alternative to DXA for osteoporosis diagnosis in clinical settings. Given the growing emphasis on economic considerations in healthcare decisions, it is important to discuss the cost- effectiveness and economic benefits of REMS as a diagnostic tool for osteoporosis. During this lecture, we will introduce the rationale and significance of economic assessments in healthcare decision-making, review and discuss existing studies on the economic benefits of REMS and finally examine the generalizability of these findings.
Economic evaluations play a crucial role in healthcare, guiding policymakers and clinicians in the efficient allocation of resources while ensuring optimal patient outcomes. The cost-effectiveness of diagnostic tools such as REMS is therefore essential in determining their value in routine clinical practice. A recent study by Reginster et al. (JBMR Plus. 2025) evaluated the cost-effectiveness of REMS in the United States, revealing that REMS followed by treatment leads to improved health outcomes, including increased quality-adjusted life years (QALYs) and a reduction in fractures, while also lowering fracture-related costs compared to scenarios without diagnosis and treatment. For example, utilizing REMS to achieve a 5% increase in diagnosing and treating women over 50 years old who are at high or very high risk of fractures is estimated to result in approximately 30,000 life years gained, 43,500 QALYs, and the prevention of 100,000 fractures over a lifetime, assuming real-world medication adherence. The incremental cost-effectiveness ratio (ICER) of REMS was estimated at $33,891 and $49,198 per QALY gained under full adherence and real-world adherence scenarios, respectively, both well below the US cost-effectiveness threshold of $100,000 per QALY. Beyond the US context, assessing the broader applicability of these findings is essential, as factors such as healthcare system structures, treatment protocols and costs, and population demographics may influence the economic benefits of REMS in other regions. This lecture will therefore also explore the transferability of the economic benefits of REMS to different healthcare settings, assessing its potential as a cost-effective approach to osteoporosis diagnosis and management.

SY13
REMS: BONE DENSITY ASSESSMENT WITHOUT IONISING RADIATION - AN ALTERNATIVE TO DXA?

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Dual-energy X-ray Absorptiometry (DXA), introduced in the 1980s, remains the standard technique for assessing bone mineral density (BMD) and diagnosing osteoporosis. However, DXA is limited by its reliance on ionising radiation, lack of portability, and susceptibility to artefactual BMD elevation, particularly in patients with spinal osteoarthritis.
Radiofrequency Echographic Multi Spectrometry (REMS) is an emerging ultrasound-based technology that addresses these limitations. REMS is radiation-free, making it suitable also for vulnerable populations such as pregnant women, children, and those requiring frequent monitoring. Its portability also enables use in immobile or house-bound patients.
Notably, REMS applies spectral analysis to differentiate true bone signal from artefact, potentially improving diagnostic accuracy in patients with spinal osteoarthritis (which is a known limitation of DXA). Recent clinical studies have demonstrated the validity of REMS in such contexts, showing strong correlation with DXA measurements while avoiding common artefacts.
In conclusion, REMS represents a promising alternative for BMD assessment, particularly in clinical scenarios where DXA is contraindicated, inaccessible, impractical or limited by artefact.

SY14

IS A TREAT TO TARGET (T2T) APPROACH REALISTIC IN OSTEOPOROSIS PATIENTS AT HIGH FRACTURE RISK?

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For about 20 years, treat to target (T2T) has been a commonly used strategy in the treatment of inflammatory rheumatic diseases. Early data have shown that T2T therapy is superior to usual care. Optimal T2T is possible when:

- there is consensus on the target;
- the target can be measured reliably and easily;
- the target reflects the current disease activity and is sensitive to change;
- the target is associated with a favorable long-term outcome;
- both the rheumatogist and the patient support this strategy;
- when the target cannot be reached, several other drugs are available.

In the lecture, the BEST-study in rheumatoid arthritis will be discussed in detail, as one of the best examples for T2T. Rheumatologists also treat patients with SLE, spondyloarthropathies and gout with a T2T strategy, which is not yet as successfull as in RA. Nevertheless, rheumatologists and their patients are used to T2T treatment, aiming at clinical remission or low disease activity in all patients. Therefore, this lecture can be an attractive start in a symposium in which the clinical relevance of T2T in osteoporosis as the preferred strategy will be discussed.

T2T in current task forces/guidelines – where are we now
B. LANGDAHL

The goal of osteoporosis management is to prevent fractures. All approved treatments reduce fracture risk, however, a T2T approach for the management of fracture risk helps ensure that the most appropriate initial treatment and treatment sequence is selected for the individual patient. A T2T approach for osteoporosis management has been described in the position statement of the ASBMR/BHOF Task Force on Goal-Directed Osteoporosis Treatment (Cosman et al.[1]). The T2T approach requires a decision about the target, which requires assessment of clinical fracture history, vertebral fracture identification, measurement of bone mineral density and consideration of other major clinical risk factors. Treatment targets should be decided based on the individual risk profile, including recency of fracture, number and severity of prior fractures, and BMD levels at the hip and spine. The choice of initial treatment should focus on reducing fracture risk rapidly for patients at very high and imminent risk and consider the probability that a BMD treatment target can be attained within a reasonable period of time. For patients at high and imminent risk of fracture and/or with very low BMD, bone anabolic treatment should be considered as the initial treatment followed by antiresorptive treatment. For patients at moderate risk of fracture, antiresorptive treatment may be appropriate. The T2T approach is also discussed in the most recent guideline on postmenopausal osteoporosis from the Endocrine Society (Eastell et al.[2]).

Can we achieve a long-term goal in osteoporosis with current drugs?
S. FERRARI

The mere concept of a treatment goal (or target) in osteoporosis is now more than 10 yrs old, yet no clear consensus has been achieved on what this goal should be. Nevertheless, BMD T-score is emerging as a most practical target, since it is not only the base for osteoporosis definition, but also directly correlated to fracture risk with as well as without therapy. A recent update from the ASBMR task force indicates a BMD T-score > -2.5 as a general goal, but a T-score above -2.0 in high-risk patients; alternatively, for those high-risk patients starting with a hip BMD T-score above -2, a minimal BMD gain of 3-5%. For many years, we have resisted the concept of treat-to-target in osteoporosis because of the limited BMD gains achieved with BPs, i.e. typically 3-5%. Denosumab demonstrated long-term gains greater than 10% at spine and 5% at hip over 10 yrs of exposure. Yet subgroup analyses of the FREEDOM Extension trial clearly showed that "target" BMD T-scores could not be achieved even with 10 yrs of treatment in those starting with very low hip BMD T-scores. In contrast, treatment sequences beginning with bone forming agents followed by an antiresorptive have allowed substantial BMD gains in lesser time. In particular, the sequence of romosozumab for one year followed by denosumab has led to BMD gains of more than 1 T-score at spine and more than 0.5 T-score at hip in just three years. For those patients with T-scores below -2.5, and even more so for those with T-score < -3.0, the probability to achieve a T-score > -2.5 was greater with the romosozumab-denosumab sequence than with romosozumab-alendronate and a fortiori than alendronate alone. In addition, in patients previously on alendronate who switched to romosozumab or teriparatide (TPT), 45% of those switched to romosozumab achieved at least 3% BMD gain at both spine and hip, whereas only 15% of those switched to TPT achieved this goal. In conclusion, achieving long-term, and in some cases even short-term, treatment goals in osteoporosis appears now more feasible than it was, thanks to the optimal use of bone forming agents and anti-resorptives' sequences. Yet for optimal long-term protection against bone fragility, sequences of biologic drugs must finally be consolidated with a bisphosphonate.

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SY15

COULD IT BE HYPOPHOSPHATASIA (HPP)? A CONVERSATION WITH EXPERTS

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This Meet-the-Expert session will explore key challenges in diagnosing and managing hypophosphatasia (HPP) in adults, focusing on practical, case-based insights and interactive discussions.
Prof Brandi will present patient cases that illustrate the diverse clinical manifestations of HPP, emphasizing the diagnostic complexity. She will discuss ways to increase awareness of HPP and symptoms that should raise suspicion, highlighting the current criteria for early recognition and accurate diagnosis and their continuing evolution.

Dr Seefried will present patient cases that highlight the systemic nature of HPP, extending beyond skeletal symptoms to emphasize broader clinical impacts. He will discuss the importance of a multidisciplinary approach to managing HPP and share insights into treatment strategies, outcome measures, and the impact on quality of life.

Both speakers will actively engage with those present through interactive discussions and Q&A sessions, encouraging participants to share challenges and experiences related to diagnosing and managing HPP.

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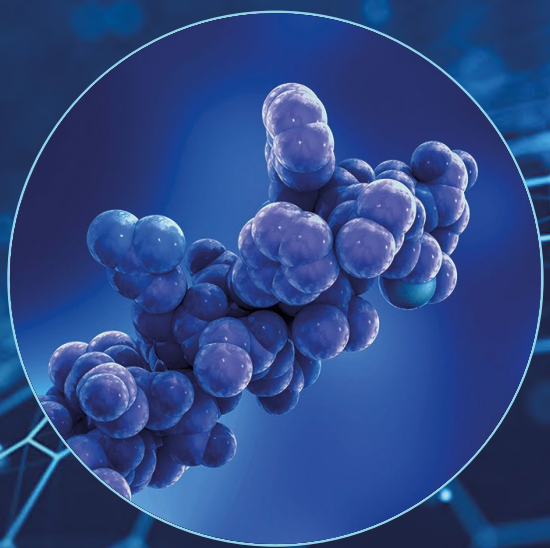

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WORLD CONGRESS ON OSTEOPOROSIS, OSTEOARTHRITIS AND MUSCULOSKELETAL DISEASES

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