OCs4-P1579
GLP-1 RECEPTOR AGONISTS AND RISK OF BONE FRACTURES IN ELDERLY PEOPLE WITH TYPE 2 DIABETES

M. Kasher Meron[1,2], T. Hornik-Lurie[3], G. Twig[4,5,6], P. Rotman-Pikielny[1,2]

[1]Department of Endocrinology, Meir Medical Center, Kfar-Saba, Israel, [2]School of Medicine, Faculty of Medical and Health Sciences, Tel Aviv University, Tel Aviv, Israel, [3]Research Department, Meir Medical Center, Kfar Saba, Israel, [4]Division of Endocrinology, Diabetes and Metabolism, Sheba Medical Center, Ramat Gan, Israel, [5]Department of Preventive Medicine, School of Public Health, Faculty of Medical and Health Sciences, Tel Aviv University, Tel Aviv, Israel, [6]The Gertner Institute for Epidemiology and Health Policy Research, Sheba Medical Center, Ramat Gan, Israel

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, $\geq$ 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 $\pm$ 6.4 years, 50% female, 66.5% were 65–75 years and 31.3% $\geq$ 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

O. Erdogan[1], T. Erdogan[2], Z. Fetullahoglu[2], D. Erbas Sacar[3], D. Seyithanoglu[2], O. Kumet[4], S. Ozkok[2], M. A. Karan[2], G. Bahat[2]

[1]Mehmet Akif Ersoy Thoracic and Cardiovascular Surgery, Training, and Research Hospital, Istanbul, Turkiye, [2]Istanbul University Faculty of Medicine, Department of Geriatric Medicine/Istanbul Musculoskeletal Health Consortium, Istanbul, Turkiye, [3]Kartal Dr. Lutfi Kirdar City Hospital, Istanbul, Turkiye, [4]University of Health Sciences Turkey, Van Training and Research Hospital, Van, Turkiye

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 ($\geq$ 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 $\pm$ 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 $\pm$ 16.94 ms vs. 46.79 $\pm$ 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

R. Pinedo-Villanueva[1], G. Fabiano[1], F. Clemeno[1], M. K. Javaid[1]

[1]University of Oxford, Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, Oxford, United Kingdom

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.

References

1. Pinedo-Villanueva, R., et al., Expected Benefits and Budget Impact From a Microsimulation Model Support the Prioritization and Implementation of Fracture Liaison Services. J Bone Miner Res, 2023. 38(4): p. 499–511.

Acknowledgements: NIHR NHSx Award AI_AWARD02169. Adopt Project team.

Disclosures: MKJ: Grant (UCB, Kyowa Kirin); Consultant (UCB, Amgen, Kyowa Kirin, Nanox-AI, Naitive Technologies, Theramex). RPV: Consultant (UCB, Mereo).

OCs7-P1401
HIGH-DOSE VITAMIN D THERAPY (300,000 IU MONTHLY): IMPLICATIONS FOR OSTEOARTHRITIS, OSTEOPOROSIS AND ARTERIAL STIFFNESS IN VITAMIN-D DEFICIENT PATIENTS

S. Sokolovic[1], I. Sokolovic-Tahtovic[2]

[1]ASA Hospital Sarajevo, Sarajevo, Bosnia & Herzegovina, [2]KCUS, Sarajevo, Bosnia & Herzegovina

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.

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

P. Bajaj[1], L. Nagendra[2], M. Samuel[3], M. Chandran[4]

[1]1.National University Health System and Ministry of Health Holdings, Singapore, Singapore, Singapore, [2]2.JSS Medical College, JSS Academy of Higher education and Research, Mysore, India, Mysore, India, [3]3.Systematic Review Unit, NUS Yong Loo Lin School of Medicine, National University of Singapore, Singapore, Singapore, [4]Osteoporosis and Bone Metabolism Unit, Department of Endocrinology, Singapore General Hospital. DUKE NUS Medical School, Singapore, Singapore

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); $P = 0.03$; $I^2 = 77\%$]. 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); $P < 0.00001$; $I^2 = 84\%$] and AC [SMD 0.44 (95% CI 0.14–0.74); $P = 0.004$; $I^2 = 8\%$]. 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.

References

Bajaj P, Nagendra L, Bajaj A, Samuel M, Chandran M. Effect of yoga on balance, falls, and bone metabolism: a systematic review of randomized controlled trials in healthy individuals. Osteoporos Int. https://doi.org/10.1007/s00198-024-07307-x.