RISK OF FRACTURE AND LOW MINERAL DENSITY IN ADULTS WITH INFLAMMATORY BOWEL DISEASES. A SYSTEMATIC LITERATURE REVIEW WITH META-ANALYSIS

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Background: Inflammatory bowel disease (IBD) such as Crohn’s disease (CD) and ulcerative colitis (UC) is associated with decreased mineral density caused by chronic inflammation and corticosteroid use. However, the increase of fracture risk is unknown and differs according to studies.

Objectives: The aim of our study is to assess the risk of fracture and low bone mineral density (BMD) in patients with IBD compared to the general population.

Methods: A systematic search of literature up to 1 February 2017 was conducted using databases including: MEDLINE (via PUBMED), EMBASE, the Cochrane library and abstracts from the ACR, ASBMR and EULAR congresses from 2014 to 2016. Prospective and retrospective cohort studies were included if they reported the incidence of fractures and/or the measure of BMD by dual energy X-ray absorptiometry (DEXA) expressed in g/cm2 in IBD patients in comparison with healthy controls. Meta-analysis was performed to assess odds-ratios (OR) for each study group using the inverse variance approach to estimate pooled OR with their 95% confidence interval. Heterogeneity was assessed according to Cochran’s Q-test and I2 values. Calculations were made with the Cochrane RevMan 5.3 software. P-values less than 0.05 were considered as significant. Data was extracted by two independent investigators.

Results: The literature search identified 1165 articles and no congress abstracts; a manual search did not retrieve any articles. Finally, 25 studies met the inclusion criteria. 9 of them reported 2065 fracture events among 42,615 IBD patients and 98,611 controls. Global risk of fracture was not significantly increased for any other site (arm, hip, wrist). The analysis of 17 studies concerning BMD showed the significant decrease of BMD and Z-score at three sites. At femoral neck, mean difference (MD) of BMD was −0.05 (95% CI: −0.08 to −0.02; p=0.001) and MD of Z-score was −0.30 (95% CI: −0.33 to −0.27; p<0.0001) at 0.30 m, lower values was respectively −0.08 (95% CI: −0.11 to −0.05; p<0.00001) and −1.01 (95% CI: −1.52 to −0.50; p=0.07), and at lumbar spine −0.06 (95% CI: −0.10 to −0.03; p=0.0003) and −0.51 (95% CI: −0.68 to −0.34; p<0.0001).

Conclusions: IBD patients have an increased risk of fractures, especially vertebral ones, suggesting the need for regular follow-up and preventing measures.

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DICKKOPF-1 (DKK1) SERUM LEVELS AND BONE QUALITY (TBS EVALUATION) IN PATIENTS WITH SYSTEMIC SCLEROSIS AND RHEUMATOID ARTHRITIS

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Background: Systemic sclerosis (SSc) as well as rheumatoid arthritis (RA) patients present an increased risk of osteoporosis (OP) as a result of the chronic inflammatory state, low vitamin D, immobilisation and other causes. The Wnt/β-catenin pathway is signalling identified like a key promoter of the osteoblastogenesis and new bone formation in inflammatory conditions. Dickkopf-1 (DKK1) is a natural inhibitor of Wnt signalling pathway that could be involved in promoting osteoclastogenesis through suppression of osteoprotegerin. Trabecular Bone Score (TBS) is an index of bone quality extracted from dual-energy X-ray absorptiometry (DXA) analysis.

Objectives: In this study, bone mineral density (BMD) and Dkk-1 levels were evaluated in SSc patients, in order to investigate possible associations between systemic OP and/or osteopenia and Dkk-1 concentrations, according to their different nailfold videocapillaroscopic (NVC) patterns of microangiopathy (NVC pattern ‘Early’, ‘Active’ and ‘Late’ in SSc patients and to compare the results regarding bone quality with RA patients and healthy subjects (CNT).

Methods: Eighty-four SSc patients, 98 rheumatoid arthritis (RA) and 80 CNT were studied. Dkk-1 serum levels were measured by ELISA methods (Quantikine Human DKK-1 Immunoassay R and D System, Minneapolis, USA). Bone Mineral Density (BMD, g/cm²) of the lumbar spine (L1-L4) was analysed by dual-energy X-ray absorptiometry (DXA) scan. Lumbar spine bone quality was derived from each spine DXA examination using the TBS analysis. Nailfold videocapillaroscopic (NVC) patterns were analysed as previous reported. Serum DKK-1 levels were significantly higher in patients with SSc than in CNT (2892±1121 pg/ml vs 2044±692 pg/ml, p<0.007). Dkk-1 levels were statistically significantly higher in patients with ‘Late’ SSc pattern than in those both ‘Active’ and ‘Early’ pattern (3467±954 pg/ml, 2290±487.8 pg/ml, 1827±883.5 pg/ml respectively, p<0.001). A negative correlation between Raynaud’s phenomenon duration (years expressed) (p<0.01) and Dkk-1 levels (p<0.0001) was also observed; TBS values were found statistically higher in SSc with an ‘Early’ NVC pattern, compared to the ‘Active’ or ‘Late’ pattern, (p<0.001). Only in the ‘Late’ NVC pattern group a significant negative correlation was observed between TBS and Dkk-1 values (p<0.001). No statistical significant difference was observed in the three groups about DXA values (p=0.13, for all areas). Serum levels of 25 (OH) D were statistically significantly higher in patients with ‘Early’ SSc pattern than in those both ‘Active’ and ‘Late’ NVC pattern (19.1±7.5, 15.1±5.3, 12.1±7.1 respectively, p<0.002).

Conclusions: The data obtained showed a significantly Increased of Dkk-1 serum concentrations together and a decreased bone mass (lower TBS and BMD) in SSc patients compared to CNT. The bone quality seems lower in SSc patients with more altered microvasculature (‘Late’ NVC pattern).

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SHORT TERM EFFECTS OF AMBIENT AIR POLLUTION ON OSTEOARTICULAR HIP FRACTURE: AN ECOLOGICAL STUDY IN A PERIOD OF 16 YEARS

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Objectives: To examine the short-term effects of outdoor air pollution on the incidence of osteoporotic HFs in a southern European region.

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Methods: This is a retrospective cohort study based on data from three database. Daily HFx Incidence was calculated using discharge data from the hospital of Alcorcón for the period 2000–2015. Daily weather conditions were compiled from records of the national meteorological station (AEMET). Daily air pollutant levels (μg/m³) were calculated from data from the Ministry of Environment for the Madrid Community: sulfur dioxide (SO₂), nitrogen monoxide (NO), nitrogen dioxide (NO₂), ozone (O₃) and particulate matter in suspension <2.5 μm (PM₂.5) and <10 μm (PM₁₀), for the same period. Pollution concentrations were categorised into quartiles (Q1 to Q4, lowest to highest). Associations between HFx incidence and air pollutant levels were examined through Generalized Additive Models (GAM) at a daily level with Poisson link function. Models were adjusted for a penalised spline function of time.

Main outcome measures: Daily hospital admissions for hip fracture.

Results: HFx incidence showed a direct association with NO, NO₂, PM₂.₅ and PM₁₀, and inverse association with O₃ levels. Incidence rate ratios for Q1 vs Q2, Q1 vs Q3 and Q1 vs Q4 respectively were: 1.171 (1.103–1.244), 1.245 (1.173–1.322) and 1.331 (1.253–1.414) for NO; 1.057 (0.996–1.122), 1.185 (1.116–1.259) and 1.276 (1.199–1.357) for NO₂; 1.028 (0.943–1.12), 1.092 (1.006–1.185) and 1.146 (1.049–1.253) for PM₂.₅; 1.083 (1.016–1.155), 1.099 (1.034–1.168) and 1.213 (1.136–1.294) for PM₁₀; and 0.975 (0.914–1.04), 0.868 (0.815–0.924) and 0.814 (0.765–0.867) for O₃. These associations persisted when the models were corrected for season, day of the week and weather conditions. When participants were stratified by age and sex, associations persisted only in women older than 75 years.

Conclusions: A short-term effect was observed of several indicators of air pollution on hip fracture incidence. This is the first study that finds this association.

Disclosure of Interest: None declared


THE RELATIONSHIP BETWEEN ESTIMATED BONE STRENGTH BY FINITE ELEMENT ANALYSIS AT THE PERIPHERAL SKELETON TO AREAL BMD AND TBS AT LUMBAR SPINE IN ADULTS

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Background: Bone strength, estimated by finite element (FE) analysis based on high resolution peripheral quantitative computed tomography (HR-pQCT) images is an important contributor to understanding risk of fracture. However, it is a peripheral device and cannot be evaluated in vivo at lumbar spine L1-L4.

Objectives: The aim of this study was to investigate if the axial bone quality can be predicted by strength measurements of peripheral bone.

Methods: Peripheral bone microarchitecture, areal bone mineral density (aBMD) and trabecular bone score (TBS) were measured in adults individuals (n=262, 60 years and older; 63% women). Stiffness and failure load were estimated by FE analysis at HR-pQCT images at radius and tibia. Areal BMD and TBS were measured by dual energy X-ray absorptiometry (DEXA) at L1-L4. Correlations between peripheral and axial data were estimated for each gender adjusted by age, weight, and height.

Results: Areal BMD L1-L4 resulted in weak to moderate significant correlations with stiffness and failure load at radius (women: R²=0.178, p<0.05 and R²=0.187, p<0.001, respectively; men: R²=0.454 and R²=0.451, p<0.001, respectively) and at tibia (women: R²=0.211 and R²=0.216, p<0.001, respectively; men: R²=0.488 and R²=0.502, p<0.001, respectively). TBS showed a very weak or no correlation with stiffness and failure load at radius (women: R²=0.148 and R²=0.150, p<0.05, respectively; men: R²=0.108 and R²=0.106, p<0.05, respectively) and at tibia (women: R²=0.146 and R²=0.150, p<0.05, respectively; men: R²=0.072 and R²=0.078, respectively).

Conclusions: These data suggest that aBMD L1-L4 was better explained by peripheral bone strength characteristics than the TBS, mainly in men and tibia is generally the site with a better relationship.

Disclosure of Interest: None declared


THE PREVALENCE OF PAIN FLARES: IMPACT OF DEFINITION

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Background: Rapid acute pain exacerbations, colloquially called pain flares, affect quality of life and are a key driver for patients to seek healthcare. There is no standardised definition of pain flare. ¹ Daily collection of patient-reported symptoms with mobile technology enables monitoring pain flares in real-time. The