

OP0066

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

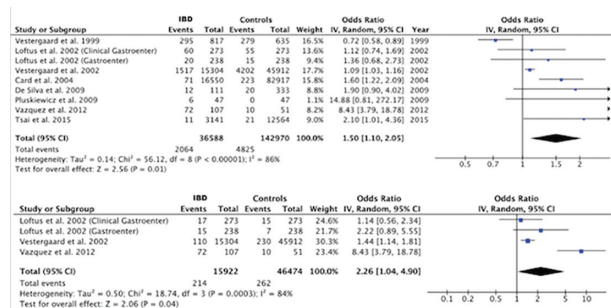
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**Background:** Inflammatory bowel disease (IBD) such as Crohn's disease (CD) and ulcerative colitis (UC) is associated with decreased mineral density caused by chronic inflammation and corticosteroid use. However, the increase of fracture risk is 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 st 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/cm<sup>2</sup>) in IBD patients in comparison with healthy controls. Meta-analysis was performed to assess odds-ratios (OR) for each studied 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 I<sup>2</sup> 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 4825 fracture events among 2 03 240 healthy controls. Global risk of fracture was increased in IBD patients compared with controls with pooled OR at 1.50 (95% CI: 1.10 to 2.05; p=0.01). The pooled OR of vertebral fracture was 2.26 (95% CI: 1.04 to 4.90; p<0.001). Fracture risk 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 -0.48 (95% CI: -0.64 to -0.33 P<0.00001). At total femur, this 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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OP0067

### 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/ $\beta$ -catenin pathway is signalling identified like a key promoters of the osteoblastogenesis hence of the 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.<sup>1</sup> Trabecular Bone Score (TBS) is an index of bone quality extracted from dual-energy X-ray absorptiometry (DXA) analysis.<sup>2</sup>

**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 patterns 'Early', 'Active', and 'Late')<sup>3</sup> 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 60 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/cm<sup>2</sup>) 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.<sup>3</sup> 25 hydroxyvitamin D (25(OH)D ng/ml) serum concentration was evaluated in all subjects.

**Results:** 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±954.1 pg/ml, 2290±487.8 pg/ml, 1827±888.3 pg/ml respectively, p<0.0001). A negative correlation between Raynaud's phenomenon duration (years expressed) (p<0.01) and Dkk-1 levels (p<0.001) was also observed. TBS values were found statistically higher in SSc with a '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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OP0068

### SHORT TERM EFFECTS OF AMBIENT AIR POLLUTION ON OSTEOPOROTIC 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 HFx in a southern European region.

**Methods:** This is a retrospective cohort study based on data from three databases. 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 (mcg/m<sup>3</sup>) were calculated from data from the Ministry of Environment for the Madrid Community: sulfur dioxide (SO<sub>2</sub>), nitrogen monoxide (NO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>) and particulate matter in suspension <2.5 µm (PM<sub>2.5</sub>) and <10 µm (PM<sub>10</sub>), for the same period. Pollutant 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, NO<sub>2</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> and inverse association with O<sub>3</sub> levels. Incidence rate ratios for Q1vsQ2, Q1vsQ3 and Q1vsQ4 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 NO<sub>2</sub>; 1.028 (0.943–1.12), 1.092 (1.006–1.185) and 1.146 (1.049–1.253) for PM<sub>2.5</sub>; 1.083 (1.016–1.155), 1.099 (1.034–1.168) and 1.213 (1.136–1.294) for PM<sub>10</sub>; and 0.975 (0.914–1.04), 0.868 (0.815–0.924) and 0.814 (0.765–0.867) for O<sub>3</sub>. 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

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OP0069

#### 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 (DXA) 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: R<sup>2</sup>=0.178, p<0.05 and R<sup>2</sup>=0.187, p<0.001, respectively; men: R<sup>2</sup>=0.454 and R<sup>2</sup>=0.451, p<0.001, respectively) and at tibia (women: R<sup>2</sup>=0.211 and R<sup>2</sup>=0.216, p<0.001, respectively; men: R<sup>2</sup>=0.488 and R<sup>2</sup>=0.502, p<0.001, respectively). TBS showed a very weak or no correlation with stiffness and failure load at radius (women: R<sup>2</sup>=0.148 and R<sup>2</sup>=0.150, p<0.05, respectively; men: R<sup>2</sup>=0.108 and R<sup>2</sup>=0.106, p<0.05, respectively) and at tibia (women: R<sup>2</sup>=0.146 and R<sup>2</sup>=0.150, p<0.05, respectively; men: R<sup>2</sup>=0.072 and R<sup>2</sup>=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.

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WEDNESDAY, 13 JUNE 2018

## New drugs – new perspectives: clinical and regulatory issues concerning biosimilars

### OP0070-HPR IS PATIENTS' SATISFACTION WITH BEING SWITCHED TO A BIOSIMILAR MEDICATION ASSOCIATED WITH THEIR LEVEL OF HEALTH LITERACY? RESULTS FROM A NORWEGIAN USER SURVEY

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**Background:** Economically motivated switching to biosimilar medication has been practiced in Norway since March 2016. There are several studies comparing the efficacy, safety and immunogenicity of biosimilars, however no studies have yet described patients' experiences and attitudes towards economically motivated switching.

**Objectives:** The aim of this study was to describe patients' experiences regarding being switched to an alternative medication (the switch) and further to investigate possible associations between such switching and health literacy.

**Methods:** Potential users of Etanercept or Infliximab were asked to participate using three patients' interest associations. Data from this convenience sample was collected using a web-survey in January 2017. Attitudes and experiences with a possible switch to an alternative medications were assessed using several questionnaires. In addition, data on gender, age and marital status were collected. Patients' experiences, attitudes and satisfaction were assessed using a self-developed questionnaire. In addition, health related literacy was measured using The Health Literacy Questionnaire<sup>1</sup> a multi-dimensional validated questionnaire. We used three domains covering patients' ability to actively engage with health care providers (Scale 6), ability find good health information (Scale 8) and understanding health information well enough to know what to do (Scale 9). Data were analysed using multiple logistic regression and the results expressed as odds for being satisfied with the switch.

**Results:** Of all included responders (n=290), 155 reported being switched to a biosimilar medication in 2016. Median age was 51 years, range 20–74. The majority of responders were females, 61% (n=176) and more than half (51%) completed higher education. Over 80% of those who were switched (economically motivated switch to a biosimilar drug) were neutral or satisfied with their new medication. Patients who were dissatisfied with being switched had lower levels of health related literacy compared to patients who were satisfied. Further, older patients reported more often being satisfied compared to younger patients. Only 14% reported that they were involved when a decision to being switched was made, male patients significantly more often compared to female patients (p=0.02). Self-assessed good health was strongly associated with higher probability of being satisfied with the switch, only 9/74 patients who reported bad health also reported being satisfied. When adjusted for age and self-assessment of one's own health, scales 6 and 8 but not scale 9, were significantly associated with higher odds for being satisfied with being switched (OR=2.5, 95% CI: [1.2 to 5.2] and OR=2.7, 95% CI: [1.2 to 5.9], for scale 6 and 8, respectively).

**Conclusions:** A great majority of patients reported being satisfied with being switched to a cheaper biosimilar medication, however, almost one in five (19%) reported being dissatisfied. Our findings suggest that patients' attitudes and level of satisfaction are associated with being given sufficient and necessary information concerning their health.

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## Movement in musculoskeletal pain; from risk to management

### OP0071 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.<sup>1</sup> Daily collection of patient-reported symptoms with mobile technology enables monitoring pain flares in real-time. The