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SAT0469

PROSPECTIVE STUDY ASSESSING BONE MINERAL DENSITY AND RISK FACTORS FOR OSTEOPOROSIS IN PATIENTS WITH ANDROGEN DEPRIVATION THERAPY. PRELIMINARY CROSS-SECTIONAL RESULTS

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Background: Few studies have analysed the incidence and risk factors for osteoporosis (OP) development in patients with prostate cancer (PC) and androgen deprivation therapy (ADT).

Objectives: To assess risk factors for OP, bone turnover markers (BTM) and bone mineral density (BMD) in a cohort of patients with ADT, as well as the duration of ADT and previous treatments received for PC.

Methods: Ongoing prospective study including patients with ADT for PC. Risk factors for OP, BTM (total ALP, bone ALP, CTx), spinal X-Ray and BMD (Lunar, DPX) were assessed yearly since inclusion in the study (April 2018). Patients with known OP or previous antiosteoporotic treatment were excluded. The study was approved by the ethics committee, and all patients gave their signed consent. Herein we present the preliminary cross-sectional study at inclusion.

Results: Of the 83 patients attended at the Rheumatology Department during the study period, 75 were included with a mean age 75±5 years and median ADT duration of 1 year. 18 were receiving concomitant radiotherapy and 7 docetaxel. When assessing risk factors for OP: 28% had previous fragility fractures and 24% had current alcohol intake. After X-Ray assessment, 14% had morphometric vertebral fractures. Mean 25OHD at inclusion was 19±9 ng/ml (73% had 25OHD <30 ng/ml) and mean testosterone was 82±162 ng/dL (75% had levels <50 ng/dL). All patients had increased values of CTx and 9% had increased bone ALP levels. BMD showed up to 28% with densitometric OP and osteopenia in 56%. Patients with OP were older (83±7 vs 74±8 years, p=0.021), had lower testosterone levels (16 vs 89 ng/dL, p=0.004), as expected lower BMD (at spine, proximal femur and even distal radius) and had more previous fragility fracture (75 vs 19%, p=0.022). But it should be noted that 16% had high bone mass (HBM) mostly affecting spine BMD (in 6 patients combined with femoral osteopenia). All patients with HBM had high bone metastatic disease, and no differences were observed between patients with/without HBM when comparing BTM or calcium-phosphate metabolism.

Conclusion: Low bone mass (including osteoporosis and osteopenia) is frequent in patients with ADT as well as previous fragility fractures. Up to 16% had high bone mass, being mostly in patients with high volume metastatic disease. Thus, all patients with ADT should undergo a bone health assessment and start antiosteoporotic treatment if required.

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SAT0470

FRAX AND DXA-BASED APPROACHES IN DIAGNOSTICS OF OSTEOPOROSIS RISK IN POSTMENOPAUSAL WOMEN WITH RHEUMATOID ARTHRITIS

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Background: Nowadays, the bone mineral density (BMD) measured by DXA and FRAX[®] are the most important methods for fracture risk assessment. Rheumatoid arthritis is a crucial disease for bone loss and osteoporosis development [1] which is included into FRAX algorithm. Ukrainian version of FRAX [2] is a new one and its value should also be assessed in patients with RA.

Objectives: Our study was aimed to assess the parameters of BMD and FRAX in postmenopausal women with RA.

Methods: We have examined 635 postmenopausal females aged 50-89 years old which were divided into 2 groups: 1st (control, n=313) – without any factors which have influence on bone metabolism, 2^d (n=322) – patients with RA. The 10-year probabilities of hip fracture and major osteoporotic fractures were

calculated without BMD parameter using the Ukrainian FRAX model [2]. The DXA was used to measure the lumbar spine, femoral neck and total body BMDs; the T-score was calculated (DISCOVERY Wi, Hologic, Inc., USA).

Results: FRAX indexes for major osteoporotic and hip fractures were significantly higher in patients with RA (Me [25-75Q]: 9.7 [6.8-15.0] and 3.1 [1.5-6.2] % compared to 6.0 [3.8-8.5] and 1.2 [0.6-2.4] % in females from the control group (p<0.001). 45.3 % of women with RA required antiosteoporotic treatment according to Ukrainian FRAX threshold ratio without measure of BMD compared to 12.1 % of subjects from control group. Only 3.4 % of patients with RA had FRAX indexes which were less than low threshold (requirement of additional DEXA measurement) compared to 31.3 % of females from control group.

BMD of femoral neck and distal radius were reliably lower in subjects with RA and consisted 0.65±0.13 and 0.69±0.12 g/cm in 1st and 2^d groups, accordingly (p<0.001) and 0.56±0.10 and 0.58±0.09 g/cm (p=0.02) without any significant differences at lumbar spine and total body BMDs. 16.6 % of subjects from the control group and 31.6 % of females with RA had osteoporosis according to DXA parameters (T-score ≤ -2.5 SD).

Conclusion: FRAX should be used more widely in clinical practice for detection of risk of osteoporotic fractures in subjects with RA.

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SAT0471

EFFECTS OF ONE YEAR TOFACITINIB THERAPY ON BONE DENSITY AND BIOMARKERS OF BONE TURNOVER IN RHEUMATOID ARTHRITIS

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Background: Oral JAK inhibitor, tofacitinib appeared as a new therapeutic option, beside biological therapies, which has already proven its safety and effectiveness in RA, but we lack of knowledge how it affects density of bone structures and bone turnover markers.

Objectives: The aim of this study was to assess the effects of one-year tofacitinib therapy on bone metabolism in patients with RA.

Methods: Altogether 30 RA patients with active disease were recruited and treated with tofacitinib in this 12-months follow-up study. Mean age of patients were 52.8±10.0 years, duration of rheumatoid arthritis were 7.7±5.0 years. Half of the patients haven't received biological treatment prior tofacitinib therapy, other half of the patients switched to tofacitinib therapy after completing washout. 15 patients received 2x5mg and 15 patients received 2x10mg tofacitinib daily for 12 months. On both arms 2-2 patients have discontinued treatment and excluded from the study. Assessments were performed at baseline, month 6 and 12. Levels of CRP and IgM rheumatoid factor (RF) antibodies were measured by quantitative nephelometry and levels of anti-CCP, sclerostin, osteocalcin (OC), P1NP were assessed by ELISA. Bone density was assessed by DXA (dual-energy X-ray absorptiometry, Lunar) and pQCT imaging techniques. Levels of DKK-1, OPG, RANKL were measured by multiplex microbead immunoassay (BioLegend LEG-NDPlex). In addition, disease activity (DAS28), age and disease duration were also measured. Correlations were determined by Spearman's analysis. Univariate and multiple regression analysis using the stepwise method was applied to investigate independent associations between DXA measurements (dependent variables) and laboratory parameters (independent variables).

Results: Tofacitinib significantly reduced DAS28 (p<0.001) and HAQ values (p=0.001), also level of CRP (p<0.001) and We (p=0.014). With respect to bone biomarkers we have experienced significant increase in levels of OC (p=0.013), OPG (p=0.006), sclerostin (p=0.026) and vitamin-D (p=0.017) at month 6, also in levels of OPG and vitamin-D (p=0.004, p=0.003) at month 12. We have found decrease in levels of CTX at month 6 (p=0.009) and 12 (p=0.003). When we examined the groups separately, we've found significant increase in levels of P1NP (p=0.027, p=0.005), OPG (p=0.005, p=0.002) and vitamin-D (p=0.001, p=0.004) at month 6 and 12, also in OC at month 6 (p=0.027) in Group A (2x5mg). In Group B (2x10mg) we've experienced a significant decrease in levels of phosphate and CTX at month 6 and 12 (p=0.012, p=0.021, and p=0.005, p=0.007).

Conclusion: One year tofacitinib treatment effectively stabilized bone density in patients with rheumatoid arthritis, and led to the increase of bone turnover markers, which is beneficial for ossification in long term.

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SAT0472

GOAL-DIRECTED TREATMENT OF OSTEOPOROSIS IN PATIENTS WITH RHEUMATOID ARTHRITIS USING DENOSUMAB FOR FIVE YEARS

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Background: Osteoporosis (OP) is frequent complication identified in patients with rheumatoid arthritis (RA). Effective treatment must be provided to treat OP in RA (RAOP). Denosumab (DMB) is one of the promising drugs that are currently being used for the treatment of RAOP. We reported the results of 12-month DMB treatment for RAOP as part of Japanese multicenter registry study (TBCR-BONE) in EULAR2016 [1]. Recently, a treatment goal of OP was reported by the American Society for Bone and Mineral Research and the National Osteoporosis Foundation (ASBMR-NOF) working group [2]. This report advocated that the goal of treatment is a T-score of >-2.5 at the femoral neck, total hip (TH) or lumbar spine (LS) on DXA if the primary reason for starting treatment was a T-score of ≤ -2.5 at the abovementioned skeletal sites. The working group noted that it was reasonable to expect that initial treatment should offer at least a 50% chance of achieving the treatment goal within 3 to 5 years of initiating therapy. We have reported the achievement rates of treatment goal in RAOP with 3-year DMB treatment on RAOP in EULAR2019 [3].

Objectives: The aim of this retrospective study was to evaluate whether 5-year DMB treatment can achieve treatment goal of OP using data from TBCR-BONE.

Methods: The study included 46 female patients who had completed 5-year DMB treatment. The LS-BMD analysis included 22 patients with a baseline (BL) LS-BMD T-score of ≤ -2.5 . The TH-BMD analysis included 29 patients with a BL TH-BMD T-score of ≤ -2.5 . Similar to clinical setting in Japan, 60mg of DMB was administered once every 6 months with a vitamin D3 supplement. BL characteristics, change in T-score over time, and achievement of the treatment goal (T-score >-2.5) were evaluated.

Results: BL characteristics of the 46 female patients included: mean age of 69.1 years and RA duration of 16 years. Prednisolone was administered to 37% of the patients. In the LS-BMD analysis, T-scores improved significantly; the mean value at BL was -3.4 , which increased to -3.0 at 1 year, -2.6 at 3 years, and ultimately to -2.5 at 5 years. The fraction of patients who achieved the treatment goal was as follows: 36.4% at 1 year, 40.9% at 2 years, 45.5% at 3 years, 50.0% at 4 years, and 54.5% at 5 years (Fig. 1A). The patients who achieved this treatment goal were those who had a significantly lower risk of fracture at BL as determined by FRAX (17.9% vs. 32.2%, $p = 0.044$), who had significantly higher BL serum TRACP-5b level (572.8 vs. 401.0; $p = 0.03$), and who had significantly better BL LS-BMD T-scores (-3.0 vs. -3.9 , $p < 0.01$) than the nonachievers. In the TH-BMD analysis, T-scores improved significantly; the mean value at BL was -3.0 , and it increased to -3.0 at 1 year, -2.7 at 3 years, and reached -2.7 at 5 years. The fraction of patients who achieved the treatment goal was as follows: 20.7% at 1 year, 31.0% at 2 years, 34.5% at 3 years, 31.0% at 4 years, and 37.9% at 5 years (Fig. 1B). The patients who achieved this treatment goal were those who had significantly better BL TH-BMD T-scores (-2.7 vs. -3.2 ; $p < 0.01$) than the nonachievers. Cut-off values at BL for achievement of the treatment goal determined using ROC analysis were -3.1 for the LS-BMD (sensitivity 83.3%, specificity 90.0%) and -2.85 for the TH-BMD (sensitivity 100.0%, specificity 81.0%).

Conclusion: The results of this study suggested that achievement of the treatment goal was comparatively easy for those with LS-BMD loss; however, it was comparatively difficult for those with TH-BMD loss. Early initiation or longer duration of DMB therapy may be necessary to improve achievement rates. Likewise, other agents, such as romosozumab, may be considered for those with significant TH-BMD loss.

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SAT0473

COMPARISON OF THE FRACTURE RISK IN WOMEN WITH AND WITHOUT SCOLIOSIS THROUGH DUAL-ENERGY X-RAY ABSORPTIOMETRY

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Background: Osteoporosis is known to be a risk factor for fragility fractures [4, 5]. On one hand, vertebral body fragility fractures often lead to additional spine deformity [2]. On the other hand, it was found that with the progression of the spinal curvature in osteoporotic patients, the fragility fractures develop more frequently. The increased incidence of these fractures could be explained with a predominance of the mechanical forces on the one side of the already weakened osteoporotic vertebrae [3].

Objectives: The aim of this study is to compare the fracture risk (FRAX) for major osteoporotic fractures (MOF) and for hip fractures (HF) in women with and without scoliosis through dual-energy X-ray absorptiometry (DXA)

Methods: In the current study, 59 women underwent DXA scans. Scoliosis was defined as Cobb's angle $\geq 5^\circ$ according to the Chaklin's classification [6, 7]. Cobb's angle was measured from DXA images with DICOM software. We evaluated the following risk factors: previous fractures, parental hip fractures, secondary osteoporosis, rheumatoid arthritis, use of corticosteroids, current smoking and alcohol consumption more than 3 units daily. We estimated FRAX MOF and FRAX HF on the basis of these risk factors and on the basis of the femoral neck bone mineral density (BMD). The calculations were done through FRAX tool published on the website of the University of Sheffield [1].

Results: The mean age of the women was 63 years (yrs.) $\pm$ 10 yrs. (range 43 yrs. – 89 yrs.). Subjects with scoliosis were significantly older (67 yrs.) than those without scoliosis (59 yrs.), ($p = 0.004$). Mean weight and height didn't differ between the groups with- and without scoliosis. Mean lumbar spine BMD and T-score differed significantly between the groups, ($p = 0.02$). Women with scoliosis had lower mean BMD (0.786/g/cm²) and lower mean T-score (-2.1 standard deviations (SDs)) compared to those without scoliosis (mean BMD: 0.912/g/cm² and mean T-score: 0.9 SDs). The mean FRAX MOF (19.3%) and FRAX HF (5.9%) of the subjects with scoliosis were significantly higher than those of the women without scoliosis (FRAX MOF: 14.9% and FRAX HF: 3.1%), ($p = 0.004$ for FRAX MOF and $p = 0.010$ for FRAX HF).