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%).

Fig1. Change of percentage of patients with T-score >-2.5

A: results of lumbar spine bone mineral density (n=22)
B: results of total hip bone mineral density (n=29)

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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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).