Influence of Glucocorticoids on Trabecular Bone Score in Patients with Rheumatoid Arthritis

Vladyslav Povoroznyuk[1], Tetiana Karasevska[2], Nataliia Dzerovych[3]
[1]D. F. Chebotarev Institute of Gerontology NAMS
[2]National Medical University n.a. O.O. Bohomolets
Ukraine
E-mails: [1]okfpodac@ukr.net, [2]11karat@ukr.net, [3]zeronat@ukr.net

Abstract: Introduction. Rheumatoid arthritis (RA) is a chronic inflammatory rheumatic disease and a frequent cause of secondary osteoporosis induced by the chronic inflammatory condition and a long-term glucocorticoid therapy (GC). Bone disorders are the main extra-articular complications of rheumatoid arthritis (RA). Patients with RA have a greater risk of osteoporosis and fracture than the general population.
The aim of this study is to evaluate the influence of GC on the trabecular bone score (TBS), bone mineral density (BMD) and TBS dynamics during one year in patients with RA.
Materials and methods. 134 examined women with RA (age 52.5±12.8 years; height 162.6±6.4 cm, weight 68.2±13.7 kg, duration of disease 9.1±7.5 years, duration of postmenopausal period 7.6±7.2 years) were divided into three groups: first group, G1, includes 37 patients who did not use GC, second group, G2 – 50 patients who used GC in a dose of more than 5 mg of prednisolone for more than 3 years, third one, G3 – 47 patients who took GC only at the exacerbated stage for less than 6 month. All the patients had been taking methotrexate as a basic treatment.
BMD of total body, lumbar spine, proximal femur and forearm were measured using the DXA method (Prodigy, GEHC Lunar, Madison, WI, USA) and posterior anterior spine TBS was assessed by means of TBS iNsight® software package installed on our DXA machine (Med-Imaps, Pessac, France). Evaluation of TBS dynamics in the patients of G1 & G2 groups during the year was conducted on the background of ongoing therapy which included doses of GC (for the patients of second group) and/or without any osteotropic treatment.
Results. The 3 groups did not differ as to age, basic anthropometric parameters, duration of disease and duration of postmenopausal period in these groups.
TBS in G2 was significantly lower compared to G1 (TBSL1-L4: 1.147±0.168 vs 1.250±0.135; t=-3.07; p=0.003), and G3 compared to G1 (TBS L1-L4: 1.274±0.138; t=3.95; p=0.0002). However, there were no differences of BMD of lumbar spine and hip among groups. Only forearm BMD in the second group was significantly lower compared to the first one (0.583±0.176 g/cm2 vs 0.675±0.229 g/cm2; t=-2.18; p=0.032). Spine TBS decreased by 1.4% after one year for G1 and by 5.8% for G2.
Conclusion. For patients who are GC-users, TBS reflects bone microarchitecture deterioration which is an indicator for those patients to of a higher vertebrae and non-vertebral risk of fracture. TBS is a determinant of bone state and must be monitored during the long-term treatment with GC.

Key words: Rheumatoid arthritis, trabecular bone score, bone mineral density