

Associations between Metabolic Syndrome and Bone Mineral Density and Trabecular Bone Score in Postmenopausal Women with Non-Vertebral Fractures

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Abstract : Medical, social, and economic relevance of osteoporosis is caused by reducing quality of life, increasing disability and mortality of the patients as a result of fractures due to the low-energy trauma. This study is aimed to examine the associations of metabolic syndrome components, bone mineral density (BMD) and trabecular bone score (TBS) in menopausal women with non-vertebral fractures. 1161 menopausal women aged 50-79 year-old were examined and divided into three groups: A included 419 women with increased body weight (BMI - 25.0-29.9 kg/m²), B – 442 females with obesity (BMI >29.9 kg/m²) and C – 300 women with metabolic syndrome (diagnosis according to IDF criteria, 2005). BMD of lumbar spine (L1-L4), femoral neck, total body and forearm was investigated with usage of dual-energy X-ray absorptiometry. The bone quality indexes were measured according to Med-Imaps installation. All analyses were performed using Statistical Package 6.0. BMD of lumbar spine (L1-L4), femoral neck, total body, and ultradistal radius was significant higher in women with obesity and metabolic syndrome compared to the pre-obese ones (p<0.001). TBS was significantly higher in women with increased body weight compared to obese and metabolic syndrome patients. Analysis showed significant positive correlation between waist circumference, triglycerides level and BMD of lumbar spine and femur. Significant negative association between serum HDL level and BMD of investigated sites was established. The TBS (L1-L4) indexes positively correlated with HDL (high-density lipoprotein) level. Despite the fact that BMD indexes were better in women with metabolic syndrome, the frequency of non-vertebral fractures was significantly higher in this group of patients.

Keywords : bone mineral density, trabecular bone score, metabolic syndrome, fracture

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