

## Bone Mineral Density and Trabecular Bone Score in Ukrainian Women with Obesity

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**Abstract :** Obesity and osteoporosis are the two diseases whose increasing prevalence and high impact on the global morbidity and mortality, during the two recent decades, have gained a status of major health threats worldwide. Obesity purports to affect the bone metabolism through complex mechanisms. Debated data on the connection between the bone mineral density and fracture prevalence in the obese patients are widely presented in literature. There is evidence that the correlation of weight and fracture risk is site-specific. The aim of this study was to evaluate the Bone Mineral Density (BMD) and Trabecular Bone Score (TBS) in the obese Ukrainian women. We examined 1025 40-89-year-old women, divided them into the groups according to their body mass index: Group a included 360 women with obesity whose BMI was  $\geq 30$  kg/m<sup>2</sup>, and Group B - 665 women with no obesity and BMI of  $< 30$  kg/m<sup>2</sup>. The BMD of total body, lumbar spine at the site L1-L4, femur and forearm were measured by DXA (Prodigy, GEHC Lunar, Madison, WI, USA). The TBS of L1-L4 was assessed by means of TBS iNsite® software installed on our DXA machine (product of Med-Imaps, Pessac, France). In general, obese women had a significantly higher BMD of lumbar spine, femoral neck, proximal femur, total body, and ultradistal forearm ( $p < 0.001$ ) in comparison with women without obesity. The TBS of L1-L4 was significantly lower in obese women compared to non-obese women ( $p < 0.001$ ). The BMD of lumbar spine, femoral neck and total body differed to a significant extent in women of 40-49, 50-59, 60-69, and 70-79 years ( $p < 0.05$ ). At same time, in women aged 80-89 years the BMD of lumbar spine ( $p = 0.09$ ), femoral neck ( $p = 0.22$ ) and total body ( $p = 0.06$ ) barely differed. The BMD of ultradistal forearm was significantly higher in women of all age groups ( $p < 0.05$ ). The TBS of L1-L4 in all the age groups tended to reveal the lower parameters in obese women compared with the non-obese; however, those data were not statistically significant. By contrast, a significant positive correlation was observed between the fat mass and the BMD at different sites. The correlation between the fat mass and TBS of L1-L4 was also significant, although negative. Women with vertebral fractures had a significantly lower body weight, body mass index and total body fat mass in comparison with women without vertebral fractures in their anamnesis. In obese women the frequency of vertebral fractures was 27%, while in women without obesity - 57%.

**Keywords :** obesity, trabecular bone score, bone mineral density, women

**Conference Title :** ICO 2015 : International Conference on Obesity

**Conference Location :** London, United Kingdom

**Conference Dates :** May 25-26, 2015