

# LIPID METABOLISM AND BONE TISSUE METABOLISM IN PATIENTS WITH OSTEOARTHRITIS AND TYPE-2 DIABETES MELLITUS.

## IS THERE A CONNECTION?

*M. Oliinyk, L. Zhuravlyova*

Kharkiv National Medical University  
Kharkiv, Ukraine

**Purpose:** The study was designed to investigate the influence of lipid metabolism changes on parameters of bone tissue metabolism in patients with osteoarthritis (OA) and type 2 diabetes mellitus (T2DM).

**Methods.** A total of 85 patients (20 males), mean age  $58.00 \pm 0.82$  with OA and T2DM were examined in Kharkiv Regional Hospital, control group (nj20). All patients were divided into 3 groups: group 1 (n=21) - with OA, group 2 (n=29) - with OA and T2DM (BMI<30 kg/m<sup>2</sup>), group 3 (n=35) - with OA and T2DM (BMI>30 kg/m<sup>2</sup>). Baseline characteristics of patients included history of OA (group 1- $8.52 \pm 0.53$  years; group 2 -  $7.39 \pm 0.52$  years, group 3 -  $8.29 \pm 0.57$  years), T2DM (group 2 -  $9.85 \pm 0.97$  years, group 3 -  $8.46 \pm 0.80$  years). The examination plan included indices of lipid metabolism (the levels of total cholesterol (TC), low-density lipoproteins (LDL), very LDL (VLDL), triglycerides (TG), high-density lipoproteins (HDL). The level of alkaline phosphatase (ALP) was determined by colorimetric method, the levels of Ca, P, Mg were determined by biochemical method. The levels of osteocalcin (OC), calcitonin (Ct) were determined by ELISA. The level of HbA1c was <7.5% in all patients. X-ray examination of knees was performed for all patients.

**Results:** The level of cholesterol in patients with OA was significantly higher than the one of the control group; in patients with comorbid T2DM and OA it was even higher, and the highest levels were observed in the group of obese patients with OA and T2DM ( $p < 0.05$ ). Pair correlations between indices of lipid metabolism and bone tissue metabolism were mostly moderate or weak, no strong coupling was found. A statistically significant relations were determined that indicate a decrease of OC level with an increase in the values of TC ( $r = -0.60$ ,  $p = 0.004112 < 0.05$ ) and LDL cholesterol ( $r = -0.56$ ,  $p = 0.008210 < 0.05$ ) in patients of group 1. A significant correlation between OC and LDL ( $r = -0.53$ ,  $p = 0.003729 < 0.05$ ), and TC ( $r = -0.69$ ,  $p = 0.000035 < 0.05$ ) was determined in group 2. Also the correlation between HDL and Ca ( $r = 0.54$ ,  $p = 0.003329 < 0.05$ ), TG and P ( $r = 0.42$ ,  $p = 0.024386 < 0.05$ ), VLDL and Ct ( $r = -0.41$ ,  $p = 0.030548 < 0.05$ ) were determined in patients with combined course OA and T2DM. The biggest number of correlations was determined in group 3. The level of OC correlated with TC ( $r = -0.45$ ,  $p = 0.007293 < 0.05$ ) and VLDL ( $r = -0.39$ ,  $p = 0.019259 < 0.05$ ). We determined significant correlation between Ca and TC ( $r = 0.43$ ,  $p = 0.010704 < 0.05$ ) and VLDL ( $r = 0.41$ ,  $p = 0.015763 < 0.05$ ). Ct had moderate negative correlation with HDL ( $r = -0.48$ ,  $p = 0.003518 < 0.05$ ). Level of TG correlated with Ca ( $r = 0.41$ ,  $p = 0.013919 < 0.05$ ), ALP ( $r = 0.39$ ,  $p = 0.021883 < 0.05$ ), OC ( $r = -0.35$ ,  $p = 0.039074 < 0.05$ ), and Ct ( $r = -0.35$ ,  $p = 0.039702 < 0.05$ ) in obese patients with OA and T2DM.

**Conclusions:** The study demonstrates that the relationship between lipid metabolism and bone tissue metabolism in patients with OA alone as well as in patients with OA comorbid with T2DM can point to the influence of lipid metabolic disorders on the remodeling of the bone, which can lead to progression of osteoarticular changes in patients with OA.