# THE LEVEL OF SERUM HYALURONIC ACID AND ITS CONNECTION WITH MARKERS OF INFLAMMATION IN PATIENTS WITH COMBINED COURSE OF OSTEOARTHRITIS AND TYPE 2 DIABETES MELLITUS

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**Purposes:** The study was performed to investigate the level of serum hyaluronic acid and its connection with markers of inflammation in patients with combined course of osteoarthritis (OA) and type 2 diabetes mellitus (T2DM).

**Methods**. The study involved 92 patients (31 males), aged $54.56 \pm 0.29$ with OA and T2DM in Kharkiv Regional Hospital, control group (n=20). All patients were divided into 3 groups: group 1 (n=28) - with OA, group 2 (n=31) - with combined course of OA and T2DM (BMI<30 kg/m$^2$) and group 3 (n=33) - with combined course of OA and T2DM (BMI>30 kg/m$^2$). The survey plan included anthropometric data, global knee pain [visual analog scale (VAS)], the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), indices of carbohydrate metabolism (insulin, glucose, HbA1C, HOMA-IR). The X-ray examination of knees was performed in all patients. The level of serum hyaluronic acid (sHA), high sensitivity C-reactive protein (hsCRP), IL-6 and IL-1$\beta$ was determined by ELISA.

**Results.** The levels of hsCRP, IL-6, IL-1$\beta$ were significantly higher in 3$^{rd}$ group ($p < 0.0035$), the difference between these parameters in 1$^{st}$ and 2$^{nd}$ group was present but not significant. We found significant correlation between IL-6 and IL-1$\beta$ in all groups of patients (1$^{st}$ - =0.59; $p < 0.05$; 2$^{nd}$ - r=0.64; $p < 0.05$, 3$^{rd}$ - r=0.76; $p < 0.05$). The significant correlation between IL-6 and hsCRP was determined in group of patients with OA (r=0.56; $p < 0.05$), in the group with combined course of OA and T2DM (r=0.72; $p < 0.05$) as well as in the group with combined course of OA, T2DM and obesity(r=0.83; $p < 0.05$). The correlation between IL-1$\beta$ and hsCRP was determined in 1$^{st}$ group (r=0.42; $p < 0.05$), in the 2$^{nd}$ group (r=0.55; $p < 0.05$) and 3$^{rd}$ group (r=0.61; $p < 0.05$). A statistically significant relations between the degree of diagnosis complexity and the level of sHA were determined (M-L $\chi$2=17.82 p=0.0031). The level of sHA significantly correlated with level of hsCRP in all groups of patients (1$^{st}$ - r=0.54; $p < 0.05$; 2$^{nd}$ - r=0.47; $p < 0.05$, 3$^{rd}$ - r=0.67; $p < 0.05$). Also, a correlation was determined between sHA and the level of IL-6 and IL-1$\beta$ in groups of patents with OA (r=0.39; $p < 0.05$; r=0.42; $p < 0.05$), with OA and T2DM (r=0.55; $p < 0.05$; r=0.50; $p < 0.05$) and with combined course of OA, T2DM and obesity (r=0.72; $p < 0.05$; r=0.68; $p < 0.05$).

**Conclusion.** The presence of significant correlations between sHA, hsCRP, IL-6 and IL-1β in patients with combined course of OA and T2DM and even more significant correlations in patients with combined course of OA, T2DM and obesity demonstrates that T2DM and obesity can be important factors that contribute to disorders of metabolic processes and progression of OA.