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THE ROLE OF MATRIX METALLOPROTEINASE-9 IN THE COURSE OF OSTEOARTHRITIS IN PATIENTS WITH OBESITY

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Recent epidemiological studies indicate a steady increase in the prevalence of osteoarthritis (OA) in the population. Of particular concern is the progression of OA in people of working age: as a cause of disability, the disease ranks first among diseases of the musculoskeletal system. Obesity, which leads to mechanical stress in cartilage and bones, is considered one of the leading risk factors for OA. Abnormal loading induces the expression of catabolic enzymes in chondrocytes, such as matrix metalloproteinases (MMPs). Several subfamilies of MMP are involved in the formation of erosions in the cartilage tissue of the joint, which play a major role in the destruction of the extracellular matrix, cartilage, and subchondral bone. MMP 9 is considered one of the main proteinases involved in the implementation of destructive processes in OA.

The purpose of the work: to determine the role of MMP-9 in the course of osteoarthritis in young people with obesity.

Materials and methods. 75 patients with osteoarthritis, suffering from obesity or excess body mass (the main group) were examined. In 50 patients, joint damage was observed with the retained body mass index (BMI) within the norm (comparison group). 37 practically healthy persons entered the control group. The average age of the sick main group was $30,92 \pm 0,55$ years; in the comparison group - $30,95 \pm 0,55$ years. All patient groups were representative of age and article.

The diagnosis of OA was established using the "Management Protocols for patients with OA". The presence and severity of obesity (OB) was assessed according to the criteria of the International Diabetes Federation (IDF, 2005) based on the calculation of the body mass index (BMI) using the Quetelet formula. The level of MMP-9 was

determined in blood plasma by enzyme immunoassay using FineTest EH0238 reagent kits (China). Statistical analysis was performed using the software package "Statistica 10.0" and Excel 2010.

The results. Taking into account BMI, the main group of patients was divided as follows. Thus, 22 patients with OA were overweight; in 31 cases, obesity 1 st. was registered; in 22 patients BMI corresponded to obesity 2 Art. When calculating the content of MMP-9 in patients of the main group, significantly higher indicators of this enzyme were determined than in controls (14.16 ± 0.29 ng/ml vs. 3.45 ± 0.08 ng/ml, $p < 0.05$). The level of MMP-9 in the blood serum of the patients of the comparison group was also significantly higher (1.8 times) than the indicators of the control group (6.4 ± 0.15 ng/ml, $p < 0.05$) and probably lower compared to the patients of the main group ($p < 0.05$). When determining the content of MMP-9 taking into account the stage of obesity, the following results were obtained: with excess weight, the content of MMP-9 was equal to 12.79 ± 0.43 ng/ml, with obesity 1 st. – 13.39 ± 0.34 ng/ml, obesity. 2 st - 16.61 ± 0.41 ng/ml.

In other words, it is possible to assume that an increase in fat tissue triggers a series of events, which are characterized by the allocation of inflammatory adipokins. This, in turn, contributes to the formation of chronic systemic inflammation in the joints' tissues. The excess of the MMP-9 synthesis complicates the course of OA because of the strengthening of inflammation and development of the deflow of joints, that is, contributes to the progression of disease.

Conclusions. The development of osteoarthritis in patients with overweight and obesity is accompanied by an increase in the content of MMP-9, which can be considered as an unfavorable factor of progress in the joints, thus worsening the quality of life of patients.

References:

1. Пасієшвілі, Л. М., Істомін, А. Г., Терешкін, К. І. & Терешкіна О. І. (2020). Поліморфізм гена рецептора вітаміну D як чинник раннього формування остеопенічних станів у разі пов'язаного перебігу остеоартриту й ожиріння в осіб молодого віку.
2. Sims, N. A., & Martin, T. J. (2020). Osteoclasts provide coupling signals to osteoblast lineage cells through multiple mechanisms. *Annual Review of Physiology*, 82, 507-529.
3. Slovacek, H., Khanna, R., Poredos, P., Jezovnik, M., Hoppensteadt, D., Fareed, J., & Hopkinson, W. (2020). Interrelationship of osteopontin, MMP-9 and ADAMTS4 in patients with osteoarthritis undergoing total joint arthroplasty. *Clinical and applied thrombosis/hemostasis*, 26, 1076029620964864.
4. Mehana, E. S. E., Khafaga, A. F., & El-Blehi, S. S. (2019). The role of matrix metalloproteinases in osteoarthritis pathogenesis: An updated review. *Life sciences*, 234, 116786.