SERUM OLIGOMERIC MATRIX PROTEIN AS A REFLECTION OF OSTEOARTHRITIC CARTILAGE TURNOVER IN PATIENTS WITH AUTOIMMUNE THYROIDITIS

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Osteoarthritis (OA) today is one of the common joint pathology accompanied with pain and one the leading cause of patient disability and limitation of life quality worldwide. It is an age-related disease with high occurrence after middle age. The adverse social situation in Ukraine with population aging creates an exceptionally great importance of the so-called aging-associated diseases including OA. Prevalence of the disease is increasing annually by 7.4% (6.6% among the working population). However, significant issue appeared recently is quite frequent occurrence of the degenerative joint pathology in patients of younger age. Increasingly, radiographic signs of OA revealed under the age of 30 years.

The articular cartilage changes in OA are considered now not only a result of the cartilage wear-and-tear, but also of the impact of various unfavorable metabolic and immune factors. It is well accepted that OA occurs in the so-called pathologic metabolic phenotype because of systemic hormonal disorders of cartilage metabolism regulation. In such case, we can consider the role of thyroid hormones and insulin on the cartilage metabolism. According to the last scientific opinion, OA is characterized by destructive changes in all joint tissues: articular cartilage, subchondral bone, synovium, tendons, ligaments, muscles and fat. OA is considered a disease of the joint as an organ with interrelated processes. The main pathologic links seen in OA joints are cartilage degradation, subchondral bone thickening, synovium inflammation, changes in periarticular tissues.

Cartilage oligomeric matrix protein (COMP) is one of the specific and perspective indicators of cartilage degradation in OA. It is a non-collagen protein of cartilage matrix, which forms collagen type II compositions and stabilizes the collagen network. Cartilage damage results in detection of protein molecules in the blood and synovial fluid. COMP is considered a useful indicator of cartilage remodeling in various articular pathology, accompanied by cartilage damage. The growing serum COMP level reflects early-stages of OA progression, and it is a high sensitive tool of radiographic changes that can be detected only in the later stages of disease.

The objective of the present study was to determine the state of articular cartilage in clinical, radiographic and biochemical associations in patients with comorbidity of OA and autoimmune thyroiditis (AIT) as the most common disease of the thyroid gland.

Materials and methods. The study involved 55 patients with OA (35 patients with comorbidity of OA and AIT, among them 10 patients with type 2 diabetes mellitus, and 20 persons with isolated OA). Patients was 37-65 years old, most of them were women (76.3%). The control group included 20 healthy same-gender and same-age individuals. All patients underwent general clinical examination with measurement of articular indices WOMAC and Lequesne, detection of serum

COMP and thyroid hormones, joint X-rays and thyroid ultrasound. OA diagnosis was based on the criteria of the American College of Rheumatologists (ACR, 1990) and recommendations of the Association of Rheumatologists of Ukraine (2005). Serum COMP detection was performed by ELISA on Labline-90 analyzer (Labline Diagnostics, Austria) with Biovendor Human COMP ELISA kit (Czech Republic).

Results. Generalized joint damage occurs in 17 patients (48,6%), gonarthrosis - 13 patients (37,1%), hand OA - 4 patients (11,4%), coxarthrosis – 1 patient (2,9%) of the main group. The levels of joint pain (224,12 ± 21,73), stiffness (105,68 ± 26,31), less of function (675,76 ± 118,21) and the total WOMAC index (1032,56 ± 120,3) were significantly higher compared to respectively data in patients with isolated OA ($p<0,05$). Joint X-rays showed grade 1 of OA (by Kellgren and Lawrence) in 23.6%, grade 2 in 50.9%, grade 3 in 25.5% of the patients.

Serum COMP median in the group of patients with comorbidity of OA and AIT was 58 (55,75 - 61,25) ng/ml, whereas in the control group - 55 (53 - 57) ng/ml ($p<0,05$). Among patients with AIT we have detected hypothyroidism (56,4%), euthyroidism (32,7%) and hyperthyroidism (10,9%). It was shown that hypothyroidism leads to the high COMP concentration in the blood compared to the same indicators in euthyroidism and hyperthyroidism (59 ng/ml, 54 ng/ml and 55 ng/ml respectively). There was no significant difference between serum COMP levels in patients with type 2 diabetes mellitus and control group.

In addition, we have determined serum COMP concentration depending on the radiographic joint space narrowing. It was revealed that AIT patients with joint space width of less than 20% of normal had higher COMP levels (59 ng/ml) in comparison with joint space width of more than 50% of normal (54 ng/ml). However, in some cases of severe OA serum concentration of COMP was lower (53-55 ng/ml), that may be a result of lack of protein synthesis in chondrocytes. Serum COMP level and the total WOMAC index correlation was also established ($r=0,68$; $p= 0,012$).

Conclusions. This study is proved that serum COMP can be used as a marker of cartilage degradation, which is correlated with the radiographic joint damage and clinical data of patients with comorbidity of OA and AIT. High COMP levels reflect the significant changes in cartilage turnover in patients with hypothyroidism. However, the manifest radiographic grade of OA is not always accompanied by a high concentration of serum COMP. This study cannot confirm the effect of insulin resistance in type 2 diabetes mellitus on the cartilage remodeling in OA.

Further investigation will determine a role of COMP as a prognostic biomarker of extracellular cartilage matrix destruction in AIT.