Cardiotrophin-1 and components of metabolic syndrome: what is the role in the development of atrial fibrillation?

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Introduction. The cardiotrophin-1 (CT-1) is a cytokine from the interleukin-6 family associated with pathology of the cardiovascular system, contributing to myocardial remodeling and the development of fibrosis in patients with hypertension. CT-1 is involved in the regulation of energy processes and the metabolism of adipose tissue, as well as in the regulation of lipid and carbohydrate metabolism. Revealed an increase in the deposition of type I collagen in the atrial myocardium against the background of dilatation of the left atrium and an increase in the expression of CT-1. The role of CT-1 in the development of AF is currently being actively studied.

Purpose. To determine the concentration of cardiotrophin-1 (CT-1) in patients with metabolic syndrome (MS) and atrial fibrillation (AF) with an assessment of the relationship with the parameters of obesity and metabolic disorders.

Methods. In a one-stage case-control study, 352 patients aged 35 to 65 years were included: patients with MS (n = 223), of which 107 patients with AF, and comparison groups consisted of patients with AF without MS (n = 69) and practically healthy examined without cardiovascular diseases and metabolic disorders (n = 60).

Results. It was found that the concentration of CT-1 in serum in patients with AF is higher than in patients with MS without AF (766,2 (539,2-1032,3) and 590,2 (480,1-922,3) pg/ml, p = 0,005) and higher than in healthy subjects (780,2 (550,2-1050,3) and 410,1 (290,2-549,2) pg/ml, p < 0,0001). It was found that in patients with AF and MS, the concentration of CT-1 in the blood serum is higher than in patients with AF without MS (851,2 (589,1-1146,3) and 681,1 (480,1-823,2) pg/ml, p = 0,004). CT-1 positively correlates with the concentration of glucose in blood plasma (r = 0,423, p = 0.002) and triglycerides (r = 0,207, p = 0,003), as well as with the waist circumference (r = 0,265, p < 0.001) and the thickness of epicardial fat (r = 0,351, p < 0,001). Using ROC analysis, it was found that with an increase in the concentration of CT-1 in blood serum more than 638,1 pg/ml, the probability of AF increased by 4 times (OR = 4.0, 95%CI 2,31-6,94, p < 0,0001).

Conclusion. An increase of serum CT-1 concentration is associated with heart remodeling and obesity in patients with MS and probably has a pathogenetic role in increasing the risk of AF in this cohort of patients.