Markers of chronic systemic inflammation in patients with ischemic heart disease in combination with autoimmune thyroiditis influenced by resveratrol

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Introduction. The incidence of coronary heart disease (CHD) is progressively increasing worldwide, despite active medical and preventive measures [1]. Furthermore, the proportion of endocrinopathies in the society is also increasing, more than 50% of which are diseases of the thyroid gland, primarily autoimmune thyroiditis (AIT) [2]. Modern scientific researches have established that chronic systemic inflammation (CSI) is of paramount importance in the development and progression of atherosclerosis, which forms the basis of coronary heart disease [3]. Apoptosis of thyrocytes in AIT also occurs with the participation of proinflammatory cytokines (CK) [4].Therefore, it is expedient to study the markers of CSI in order to assess the course of these diseases and the effectiveness of therapeutic measures [5].

The aim of our research was to study the dynamics of CSI markers in patients with coronary heart disease concurrent with AIT under the influence of polyphenol resveratrol [6].

Materials and methods. 115 patients of both sexes aged 48-69 participated in the study: 85 patients with coronary heart disease: stable exertional angina, FC II, CH 0-I and 30 patients with additional AIT diagnosis, euthyroid variant of the course, 5 of which – medically corrected subclinical hypothyroidism. 30 patients with coronary heart disease (study group 1) and 30 patients with concomitant AIT (study group 2) received standard resveratrol 100 mg daily for 2 months. 55 patients with CHD formed the comparison group. In all patients, the level of CK – tumor necrosis factor (TNFα), interleukin-1β (IL-1β) and IL-10 in blood serum was determined before the initiation of treatment and after 2 months by the immune enzyme method, the fibrinogen content (FG) in blood plasma by weight method, the content of circulating endothelial microparticles (CEM) with surface antigens CD32 and CD40 by flow cytofluorimetry using monoclonal antibodies and expression of the matrix ribonucleic acid gene (mRNA) of kappa B inhibitor (IkB) nuclear kappa B transcript (NF-kB) by real-time polymerase chain reaction (Real-time PCR) using a relative Ct method for data analysis [7, 8].

Results. In patients of all study groups, an increased content of CK was revealed, an increase in the number of CEM $CD32^+CD40^+$ ($p < 0.05$), indicating inflammatory activation and endothelium dysfunction. In 34% of patients with coronary heart disease and 25% of patients with coronary heart disease concurrent with AIT, an increase in the content of FG was observed. Expression of mRNA IkB ($2^{-\Delta C}$) in the study groups was not significantly different. Under the influence of resveratrol, the IL-1β content decreased (6.98 + 2.52 pg / ml versus 10.05 + 3.67 pg / ml, $p = 0.0022$), TNFα (7.28 + 2, 18 pg / ml versus 9.69 + 1.63 pg / ml, $p = 0.013$), there was a tendency to decrease in the content of IL-10 ($p = 0.0546$). In group 2, the content of IL-1β (6.87 + 2.13 pg / ml versus 10.06 + 2.79 pg / ml, $p = 0.0011$) and TNFα (7.94 + 3, 43 pg / ml versus 10.54 + 2.42 pg / ml, $p = 0.00045$) significantly decreased, while the content of IL-10 remained unchanged ($p = 0.455$). In the comparison group, there were no reliable changes in the content of CK. Under the influence of resveratrol, there was a decrease in CEM $CD32^+CD40^+$ in both group 1

(p = 0.038) and group 2 (p = 0.035), indicating an improvement in the function of the endothelium. In the comparison group, this indicator did not change (p = 0.547). In patients of all groups, a reliable decrease in the content of FG in blood plasma was detected (p <0.01). Expression of mRNA IkB decreased in group 2 (0.0101 + 0.0062 vs. 0.0207 + 0.0153, p = 0.031), which was calculated by the method $2^{-\Delta\Delta Ct}$ -2.006 + 0.53, and did not significantly change in group 1 (p = 0.884) and in the comparison group (p = 0.570).

Conclusion. Thus, in patients with coronary heart disease and concurrent with AIT, elevated levels of CSI and inflammatory activation of the endothelium were determined, while comorbidity determined a more significant degree of impairment. The use of resveratrol polyphenol contributed to the decrease in the levels of proinflammatory cytokines, the content of acute phase reactant of inflammation of FG in the blood, and provided an endothelioprotective effect. In comorbidity of CHD and AIT, resveratrol, along with the above-mentioned effects, caused a decrease in NF-kB-mediated signaling, which plays a leading role in the expression of inflammation genes.

Prospects for further research. The obtained results are the basis for the development and implementation of treatment regimens focused on CSI, using resveratrol in CHD, AIT and in comorbid conditions.

Recommendations. It is expedient to use inflammatory markers to assess the course of CHD, AI and in case of their combination. The application of resveratrol as an anti-inflammatory agent in the comprehensive therapy of these diseases is pathogenetically feasible and effective.

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