LABORATORY CONTROL OF IMMUNE-INFLAMMATORY AND ENDOTHELIAL DYSFUNCTION MARKERS IN PATIENTS WITH ISCHEMIC HEART DISEASE ON THE BACKGROUND OF HYPOTHYROIDISM

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Cardiovascular pathology is the main cause of morbidity, disability and mortality in the Ukrainian population. Among the European countries, Ukraine is among the first places in the mortality rate of the population from ischemic heart disease (IHD) [1]. IHD, along with the traditional risk factors and associated illnesses, in particular endocrine diseases, where hypothyroidism occupies one of the leading places, is strongly influenced by related diseases [2]. Today, thyroid disease and hypothyroidism syndrome are the most common endocrine pathology after type 2 diabetes. Thyroid function has a complex relation with various contributors to atherogenesis. In the pathogenesis of IHD, in the context of hypothyroidism, we should pay particular attention to inflammatory factors and factors of endothelial dysfunction that have proinflammatory and atherogenic effects and complicate the course of IHD [3]. Improving diagnosis and developing new approaches to the treatment of IHD has great social and medical significance.

Material and Methods. The study comprised 42 patients who were on inpatient treatment in the endocrinology department of the Kharkiv city clinical hospital № 2 named after prof. A.A. Shalimov. All patients were diagnosed and verified (documented) to have stable angina pectoris (NYHA classes II-III), and 21 patients (the first group) who had IHD on the background of hypothyroidism, which was confirmed by ultrasound scanning and laboratory examinations. Group 2 included 21 patients with IHD without structural and functional changes of the thyroid gland. The age of patients was from 52 to 75 years (average age 61.4±1.25). The control group consisted of 15 practically healthy persons of the same age. The patients underwent standard clinical examination and got the determination of the levels of tumor necrosis factor-α (TNFα), C-reactive protein (CRP), endothelin-1 (ET-1), plasminogen activator inhibitor-1 (PAI-1), neopterin using standard reagent kits (Vector-Best, Russia; Biomedica, Austria; Biomerica, USA) by the enzyme-linked immunosorbent assay (ELISA). Thyroid-stimulating hormone (TSH) and free thyroxine (free T4) levels were determined using the chemiluminescence immunoassay (CLIA). All of the provided reagents were used in accordance with analysis manual added to the kits. The reliability of the differences between the mean values was determined using Student’s t-test. The difference was considered statistically significant at the probability level of p <0.05.

Results. Having analyzed the obtained results we found a significant (p <0.05) increase in the level of the PAI-1 in the group of patients with IHD with hypothyroidism in comparison with healthy subjects (by 89.25%) and with patients with IHD without structural and functional changes in the thyroid gland (by 67.94%). The comparative analysis also showed a significantly higher ET-1 level in comparison with healthy subjects (by 2.9 times) and patients with IHD without thyroid disease (by 1.3 times) (p <0.05). The patients with IHD with hypothyroidism had the levels of neopterin, TNFα and CRP increase...
significantly higher in comparison with the control group of patients (by 2.1, 1.4 and 4.9 times, respectively). Similar results were observed when comparing levels of neopterin, TNFα and CRP in patients with IHD with hypothyroidism with a group of patients with IHD without structural and functional changes in thyroid gland: their concentration was by 2.2; 1.3 and 3.1 times higher than the corresponding indicators, respectively (p <0.05). This indicates a clear immune activation in patients with IHD in the context of concomitant hypothyroidism. The question of the relationship between markers of immune activation, inflammation and endothelial dysfunction in patients with IHD with thyroid pathology is also an interesting one. Significant positive correlation relationships were established between the level of neopterin and TSH (r=+0.36; p <0.05), ET-1 and TSH (r=+0.46; p <0.05) and inverse correlation interactions between the neopterin level concentration and free T4 (r=−0.29; p <0.05). The obtained data testify that hypothyroidism increases the risk of complications of atherosclerosis, provokes the progression of IHD both due to the development of endothelial dysfunction, stimulation of systemic inflammation and increased secretion of proinflammatory cytokines [4]. Thus, patients with IHD, which occurs on the background of hyperthyroidism, had an increase in markers of immune activation and endothelial dysfunction compared with patients with IHD without thyroid disease. The presence of correlations between the levels of neopterin and ET-1 with the hormones of the pituitary-thyroid system suggests the involvement of hypothyroidism in stimulating systemic inflammation and the development of endothelial dysfunction in patients with IHD.

Prospects for further research: Further scientific research will deal with the development of optimally substantiated schemes of differentiated combined treatment of patients with IHD on the background of hypothyroidism, taking into account changes in immune-inflammatory and endothelium dysfunction markers.

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Key words: ischemic heart disease, hypothyroidism, immune-inflammatory markers.

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INHIBITION OF MARKERS OF THE IMMUNE INFLAMMATION IN BRONCHIAL ASTHMA INFLUENCED BY FULLERENE C_{60} NANOPARTICLES

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Bronchial asthma (BA) is a chronic disease associated with local tissue inflammation and remodeling of the airway [1, 2]. Inflammation is a complex immune response which involves immune cells as regulators and effectors of the immune function and, therefore, may play critical role in pathophysiological processes. Recent studies have suggested the possible effect of dysfunction immune cells and/or their products on inflammation process in BA. Fullerene C_{60} is the most promising nanomaterial in