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GENDER FEATURES OF THE ANTIOXIDANT SYSTEM IN CORONARY HEART DISEASE WITH DYSLIPIDEMIA

Summary. It is known that in women, especially during menopause, the risk of developing coronary artery disease increases significantly, which is accompanied by oxidative stress (OS) and a decrease in antioxidant activity (AOA) of the body. IHD in men is more often diagnosed earlier and is also characterized by disorders in the "lipid peroxidation - antioxidant defense" (LPO-AOD) system. Therefore, the study of the gender characteristics of the antioxidant status of blood plasma and tissues, its relationship with the clinical course of coronary artery disease, the state of endothelial function, the metabolism of nitric oxide (NO), which has antioxidant properties, and the content of homocysteine (Hz), which is involved in oxidation processes, seems relevant.

Key words. oxidative stress, blood pressure, heart rate, levels of lipid changes, myocardial hypertrophy.

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ГЕНДЕРНЫЕ ОСОБЕННОСТИ АНТИОКСИДАНТНОЙ СИСТЕМЫ ПРИ ИШЕМИЧЕСКОЙ БОЛЕЗНИ СЕРДЦА С ДИСЛИПИДЕМИЕЙ

Резюме. Известно, что у женщин, особенно в период менопаузы, существенно возрастает риск развития ИБС, что сопровождается оксидативным стрессом (ОС) и снижением антиоксидантной активности (АОА) организма. ИБС у мужчин чаще диагностируется раньше и также характеризуется нарушениями в системе «перекисное окисление липидов - антиоксидантная защита» (ПОЛ-АОЗ). Поэтому изучение гендерных особенностей антиоксидантного статуса плазмы крови и тканей, его связь с клиническим течением ИБС, состоянием функции эндотелия, метаболизмом оксида азота (NO), обладающего антиоксидантными свойствами, содержанием гомоцистеина (Гц), участвующего в процессах окисления, представляется актуальным.

Ключивая слова. оксидативным стрессом, артериальное давление, частота сердечных сокращений, уровни липидных изменений, гипертрофии миокарда.

Introduction. The problem of coronary artery disease has acquired in recent years not only important medical, but also social significance due to the increase in morbidity, high mortality, disability of different ages [1]. Currently, the world is actively discussing the issue of gender characteristics of the course of cardiovascular diseases (CVD), which is relevant for the development of a differentiated approach in the treatment of cardiac pathology in men and women. Recent studies indicate that in order to understand the pathogenesis of coronary artery disease, further study of the systems of regulation of blood circulation is necessary. To date, there are no

differences in the approaches to the treatment of CVD in men and women in expert recommendations.

Modern measures for the prevention and treatment of CVD in Europe have contributed to a decrease in mortality in men, in contrast to women [2]. Within six months after myocardial infarction (MI), it was 7.8% in men and 22.9% in women [3].

It is known that in women, especially during menopause, the risk of developing coronary artery disease increases significantly, which is accompanied by oxidative stress (OS) and a decrease in antioxidant activity (AOA) of the body. IHD in men is more often diagnosed earlier and is also characterized by disorders in the "lipid peroxidation - antioxidant defense" (LPO-AOD) system. Therefore, the study of the gender characteristics of the antioxidant status of blood plasma and tissues, its relationship with the clinical course of coronary artery disease, the state of endothelial function, the metabolism of nitric oxide (NO), which has antioxidant properties, and the content of homocysteine (Hz), which is involved in oxidation processes, seems relevant.

Numerous studies have proven the high efficacy of statins with antioxidant properties in the treatment of coronary artery disease with dyslipoproteinemia (DLP). Gender differences in tolerability and efficacy of statins have been noted.

Purpose of the study. The purpose of the study was to assess the gender characteristics of the antioxidant status and the possibility of correcting lipid peroxidation and antioxidant defense disorders in the treatment of men and women with stable forms of coronary artery disease with dyslipoproteinemia with atorvastatin.

Materials and methods of research: The study included 49 people: 39 patients with coronary artery disease and 10 relatively healthy individuals. The study involved 39 patients with coronary artery disease with stable angina II-III FC and / or post-infarction cardiosclerosis (PICS) according to the WHO classification, aged 35 to 68 years, mean age 58.2 ± 6.4 years, who gave informed consent to participate in the study divided into 2 groups based on gender. Group 1

included 20 men, group 2 included 19 women. Control group 1 - 6 apparently healthy men, control group 2 - 4 apparently healthy women.

Patients received basic therapy (β -blockers, angiotensin-converting enzyme (ACE) inhibitors, calcium antagonists, antiplatelet agents and nitrates). The duration of the study of the effect of atorvastatin as part of cardiac therapy on the parameters of LPO-AOD, the clinical course of coronary artery disease, and endothelial function was 6 months. Patients of both groups were comparable in age, laboratory parameters, which made it possible to consider them representative for determining the effectiveness of treatment. The presence of myocardial ischemia according to ECG data, the state of endothelial function, the thickness of the intima-media complex of the common carotid artery (IM CCA), laboratory parameters were assessed before and after 6 months of treatment.

Results of the study and discussion: Significant differences in the composition of lipids revealed significant gender differences in the intensity of lipid peroxidation and the activity of tissue and plasma antioxidant enzymes: in men compared to women, the levels of DC are increased ($p<0.05$) by 9% and TBA-RP by 11%, reduced ($p<0.05$) AOA AOS CP/TF by 10%, SOD by 12% and GP by 19%. This indicates a more pronounced depletion of AOP reserves and intensification of lipid peroxidation in the group of men and confirms the data available in the literature on the role of OS in the pathogenesis of IHD. The highest SOD/GP in the group of men with coronary artery disease indicates the maximum imbalance towards oxidative stress in the system of tissue antioxidant enzymes, which is necessary to maintain a stationary concentration of reactive oxygen species (ROS). In our study, GH occurred in 23% of men and 8% of women with CAD. Significant gender differences in homocysteinemia ($p=0.01$) were revealed, in men 1.5 times higher than in women. The results of the correlation analysis of the level of Hz and LPO-AOD in patients with IHD show that in IHD with HCH and hyperlipoperoxidemia there is a significantly higher level of Hz compared to that in healthy individuals ($p<0.05$), GHz seems to be one of the factors that reduce

tissue and plasma AOD. The inverse relationship between age and Hz level in group 2 indicates the role of GHZ in the pathogenesis of CHD in young women.

A close relationship between NO metabolism and LPO-AOD parameters was revealed, especially in the group of men with coronary artery disease. A significant increase in the level of NO metabolites in a number of women with hyperlipoperoxidemia and hyperhomocysteinemia leads to an imbalance in the relationship between NO and the functioning of the LPO-AOD system. At the same time, NO itself is able to act as a pro-oxidant. In both groups of patients with coronary artery disease, compared with the control, violations of endothelium-dependent vasoreactivity were noted, significantly more pronounced in men ($p = 0.001$), and thickening of IMT CCA - gender differences are not significant. The number of ischemia episodes, including painless ones, the duration of myocardial ischemia according to ECG data was significantly higher in men with coronary artery disease. The state of the endothelium and the clinical course of coronary artery disease in both sexes is closely related to LPO-AOD.

For 6 months of treatment in both groups of patients with coronary artery disease, the levels of total cholesterol and cholesterol-LDL became <4.5 and 2.5 mmol/l; the activity of antioxidant enzymes and NO metabolites significantly increased, the intensity of lipid peroxidation decreased, approaching that in the control groups.

A more pronounced antioxidant effect of atorvastatin was found in the complex therapy of IHD with DLI in men.

The percentage of changes in the activity of SOD, GP, CP, CP/TF, NO metabolites as a result of treatment in group 1 was 35%, 95%, 30.19% and 23%, respectively, and in group 2 -16%, 47%, 16%, 8% and 12%. In group 1, the content of DC and TBA-RP decreased significantly more (by 43 and 37%) than in group 2 (by 35 and 28%). It is possible that the different antioxidant effect of atorvastatin in men and women is explained by the sex characteristics of the activity of key enzyme systems of NO-synthetases, NAD (P) H-oxidases, the difference in the balance of their synthesis of ROS and NO, as well as a more pronounced decrease

in the blood plasma of women of ubiquinone Qio - the most effective LDL antioxidant synthesized in the side chain of cholesterol synthesis.

Reducing OS and restoring the biological activity of NO are the key mechanisms behind the beneficial effects of statins on endothelial dysfunction. For 6 months of treatment in both groups, endothelial function and the clinical course of coronary artery disease significantly improved. Cardiac therapy, which included atorvastatin, contributed to a more pronounced increase in EDVD in group 1 by 34%, in group 2 - by 21% ($p < 0.05$) and had a significantly more pronounced effect on the duration of myocardial ischemia in men ($p = 0.04$), reducing it in group 1 by 88%, in group 2 - by 81%.

Conclusion. Thus, based on the studies conducted in stable forms of coronary artery disease, gender differences were revealed in the content of lipid peroxidation products, Hz, NO metabolites, and the activity of tissue and plasma antioxidant systems. A significant relationship between LPO-AOD, endothelial function, atherosclerotic lesions of the coronary arteries, and the clinical course of the disease has been proven. The non-lipid effects of atorvastatin were shown to be more pronounced in men, in particular, its effect on the activity of antioxidant enzymes, endothelial function, and the duration of myocardial ischemia, which emphasizes the need for a tender approach to correcting antioxidant status disorders in IHD with DLP.

LITERATURE

1. Abdurahimov A.A., Mamutov R.Sh. The study of the prevalence of coronary artery disease and the possibility of preventive interventions in the conditions of production teams. // Bulletin of the Association of Doctors of Uzbekistan. 2018. No. 4. pp. 33-35.
2. Kotovskaya M.A., Solovyov S.K., Nikishina N.Yu. Risk factors for the development of atherosclerosis and clinical signs of cardiovascular disorders in patients at an early stage. // Rheumatology. 2015, No. 3, pp. 67-70.
3. Libby P. Current concepts of the pathogenesis of the acute coronary syndromes. // Circulation. - 2001. - No. 104. - P. 365-372.

4. BondarK.Yu. Antioxidant properties of simvastatin in patients with ischemic heart disease with dyslipidemia / Artamoshyna N.E., BondarK.Yu., Belaya O.L., Baider L.M., Kuropteva Z.V. //Cardiovascular therapy and prevention. -2012.- No. 6.-S.16-22.

5. BondarK.Yu. Atorvastatin and oxidative stress in ischemic heart disease with dyslipidemia / BondarK.Yu., Belaya O.L., Lazutina O.M., Kuropteva Z.V., Baider L.M., Artamoshyna N.E. Yakovleva T.V. // Clinical Medicine.-2012.-JV® 10.- P.34-38.