

SOME ASPECTS OF CARDIOVASCULAR COMORBIDITY IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

N. V. Vantiukh, O. I. Lemko, D. V. Reshetar

Abstract

Chronic obstructive pulmonary disease (COPD) is a systemic condition characterized by multiple comorbidity, most often — cardiovascular diseases. The presence of past COVID-19 in history can worsen this situation. Dyslipoproteinemia is considered to be one of the major causes of atherosclerosis being the morphological basis of cardiovascular diseases.

The aim of the study was to investigate the peculiarities of the lipid profile in patients with COPD, including convalescents of COVID-19, depending on severity of the disease and the possible development of comorbid cardiovascular conditions.

Materials and methods. Complex clinical, functional and laboratory examinations were carried out in 133 patients with stable COPD (GOLD II-III). The average age of patients was $(60,3 \pm 1,71)$ years, and the average duration of the disease was $(14,2 \pm 0,89)$ years. In addition, 21 apparently healthy individuals without COVID-19 history were included in control group. The lipid profile was evaluated: total cholesterol (TC), triglycerides (TG), high- and low-density lipoproteins (HDL and LDL), β -lipoproteins (β -LP), atherogenicity index (AI). The study data was assessed considering the degree of bronchial obstruction, symptoms intensity by means of COPD Assessment Test (CAT), cardiovascular risk (CVR), body mass index (BMI) and the level of endothelin-1 as an objective index of endothelial dysfunction.

Results. Mean values of studied indices (except HDL) significantly exceeded the control levels, which, along with a 1,6-times increase in the level of TG confirmed a proatherogenic shift in the lipid spectrum. The level of HDL did not differ from the control group, which was insufficient to prevent atherosclerosis in hypercholesterolemia conditions. In COPD patients among COVID-19 convalescents the lipid profile disorders were more significant. Proatherogenic changes correlated with the ventilation disturbances severity grade. An increase in AI was noted even in cases with a relatively mild form of the disease (with $CAT < 10$ points) and further correlated with the severity of COPD manifestations ($CAT \geq 10$ points).

There was no direct correlation between dyslipidemia and BMI (except for the TG levels), possibly due to the fact that dyslipidemia was caused by systemic inflammation in COPD. At the same time, proatherogenic changes in the lipid profile were observed even at low and moderate CVR, increasing with high and very high level of CVR. Lipid profile these disorders were found even at normal level of endothelin-1. This fact in combination with similar changes in low and moderate CVR, $CAT < 10$ points and moderate bronchial obstruction demonstrated the primary nature of proatherogenic changes in lipid metabolism in COPD patients.

Conclusion. Proatherogenic disorders of lipid metabolism in patients with COPD already occur in moderate bronchial obstruction, a stable course of the disease with minimal clinical manifestations of COPD, and low CVR, without significant correlation with BMI, underlining the primary pathogenetic role of cardiovascular comorbidity. These changes were associated with more significant bronchial obstruction, intensity of COPD clinical manifestations, the level of endothelin-1, and COVID-19 history, determining the need for developing an appropriate complex of recovery treatment.

Key words: COPD, COVID-19, cardiovascular conditions, lipid metabolism.

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Nataliia Vantiukh

SI «The Scientific-Practical Medical Centre «Rehabilitation» MH of Ukraine»

PhD, associated professor, researcher

10, Velykokamyana str., 88000, Uzhgorod, Ukraine

Tel.: +38 095 4014654, natalyvan1@gmail.com