THE ROLE OF URIC ACID IN THE PROGRESSION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Abstract

Chronic obstructive pulmonary disease (COPD) is characterized by chronic inflammation, airway remodeling, and impaired lung function, leading to persistent airflow limitation and significant deterioration in the quality of life of patients. Despite active study of the mechanisms of COPD development, the pathogenesis of the disease remains partially unclear, especially in the context of the role of metabolic factors and systemic inflammation. In this context, uric acid — the end product of purine metabolism — is gaining special attention as a potential biomarker reflecting the level of oxidative stress and inflammatory processes in the body.

Aim: to assess the level of uric acid in COPD patients, establish its relationship with the severity of the disease and the frequency of exacerbations, and determine the role of uric acid as a potential biomarker for assessing the risk of disease progression.

Materials and methods. 124 patients with a diagnosis of COPD of varying severity were examined; general clinical laboratory methods were used (complete blood count, complete urine analysis, biochemical blood test - liver enzymes, glucose, creatinine, uric acid), spirometry with 400 μg salbutamol reversibility test. The blood serum uric acid level was determined by an automatic analyzer using the enzymatic photocolorimetry method. The control group consisted of 30 healthy individuals, comparable to the main group regarding gender and age. Statistical processing of the study data was carried out using Microsoft® Excel® for Microsoft 365 MSO, version 2505 build 16.0.18827.20102, 64-bit version (license number EWW_52897387-f836-4a8e-96a3-ef392a681665_da7bf7e129a8cdd7a), mean values, variation indices were calculated, and Student's t-test was used to compare two samples. The correlation analysis method was also used.

Results. It was shown that patients with COPD had a statistically significant increase in blood uric acid levels compared to patients without COPD. One third of men and 40 % of women with COPD had hyperuricemia in the absence of clinical manifestations, which was an independent risk factor for the occurrence and progression of not only cardiovascular diseases, but possibly COPD as well. The level of uric acid increases as the disease progresses, depending on the duration of the disease and the frequency of exacerbations of chronic COPD. The highest levels of uric acid were found in patients with GOLD 3 and 4, disease duration of more than 10 years, and two or more COPD exacerbations per year.

Conclusion. Determination of serum uric acid is a simple, minimally invasive, relatively inexpensive, and easily accessible routine laboratory test that can be used for risk stratification of patients with chronic obstructive pulmonary disease. Asymptomatic hyperuricemia in patients with COPD requires the administration of urate-lowering therapy, but its impact on the course of lung disease requires further research.

Key words: chronic obstructive pulmonary disease, uric acid, hyperuricemia.

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