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THE SEVERITY OF SYSTEMIC INFLAMMATORY REACTIONS IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Annotation: Analyzed plasma level of an inflammatory mediator lipoxin A4 in patients with chronic obstructive pulmonary disease (COPD) which could be used as a marker of systemic inflammation in COPD patients

Key words: Respiratory organs, lung disease, COPD, factor, bronchial gland

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Respiratory diseases, in particular chronic obstructive pulmonary disease (COPD), are one of the leading causes of morbidity and mortality in the population worldwide. According to the World Health Organization, by 2020, COPD will rank 5th in morbidity and 3rd in the structure of mortality and will
cause about 5 million deaths a year. However, according to a number of researchers, the official statistics on the incidence of COPD do not reflect the real situation, since up to 50% of cases of COPD are currently not diagnosed.

COPD is regarded as a systemic disease with multiple extrapulmonary effects, which in some cases determine the prognosis for patients. The main manifestation of COPD is a progressive impairment of the function of external respiration in an obstructive or mixed type, induced by various factors, which leads to the development of chronic inflammation, mainly in the distal parts of the respiratory tract, with the development of remodeling of the bronchial tree and reduction of pulmonary function.

Prolonged exposure to factors that have a damaging effect leads to atrophy and increasing sclerosis of the own layer of the bronchial mucosa, sclerosis of bronchial smooth muscles, atrophy and sclerosis of bronchial glands with a change in the rheological properties of bronchial secretions, which becomes more viscous and difficult to separate when coughing, which contributes to obstruction small bronchi with mucous plugs.

Activation of mediators, realized by alveolar macrophages, leads to the formation of pro-inflammatory cytokines and reactive agents, which leads to the development of bronchial hyperreactivity and promotes the progression of lung damage.

The inflammatory process has a clear staging. At different stages, different endogenous mediators are involved in it. At the initiation stage, the activation of chemokines, prostaglandins, leukotrienes, etc. takes place, having an "explosive" character, and within a few hours the inflammation passes into the second stage - the developmental stage.

The products of destruction of the pathogen, the body's own tissues and apoptotic neutrophils accumulate in the focus of inflammation. Since these products are inflammation stimulants, the 2nd stage can last as long as you like. If the process of completion of inflammation is not intense enough and the
migration of neutrophils to the inflammation focus is not completely inhibited, inflammation can become chronic. To prevent such a scenario, at the stage of development of inflammation in the body, the synthesis of mediators is switched from pro-inflammatory to anti-inflammatory, or termination mediators (prostaglandin D2, resolvins, lipoxins).

In recent years, considerable attention has been paid to the study of the process of completion of inflammation.

The main endogenous low-molecular-weight mediators stimulating the onset of the completion stage, the derivatives of arachidonic acid lipoxins, in particular lipoxin A4, were isolated and studied (Fig. 1).

Lipoxin A4 has the ability to inhibit the migration of neutrophils by suppressing their chemotactic activity, i.e. it is able to inhibit the processes of neutrophilic inflammation.

The study of its level in various diseases accompanied by the processes of systemic inflammation is a promising direction in the understanding of pathophysiological reactions.
The average level of the index of systemic inflammation of lipoxin A4 in the blood plasma of patients was 1.62 ± 0.09 ng / ml, while in healthy individuals it was 0.38 ± 0.75 ng / ml (p <0.05), which indicates the presence of a pronounced systemic inflammatory reaction in patients with COPD and the incomplete nature of the development of inflammation in the airways. At the same time, the level of lipoxin was higher in patients with COPD with stage III than with stage II (1.75 ± 0.10 ng / ml vs 1.63 ± 0.08 ng / ml), which indicates an increase in the severity of the inflammatory process with progression of the disease.

When analyzing the correlations of the obtained level of lipoxin A4 in the plasma of patients with different parameters, several important strong correlations were obtained.

All obtained correlations were considered statistically significant at p <0.05. Thus, a reliably strong direct relationship between lipoxin A4 and the level of leukocytes (r = 0.66) and, in particular, peripheral blood granulocytes (r = 0.34), was shown. It is known that lipoxin A4 is generated by various types of cells, including such active participants in inflammation as neutrophilic leukocytes. Thus, their presence indicates that inflammation in the bronchial system of patients is predominantly neutrophilic, and even in the absence of an exacerbation of the disease, the level of migration of neutrophils to the focus of inflammation and their production of inflammatory mediators are increased.

A reliable direct relationship was obtained between the level of lipoxin A4 with indicators of lipid metabolism, in particular with the level of total cholesterol (r = 0.40) and high-density lipoprotein cholesterol (r = 0.39). Previously, researchers obtained data on the hypocholesterolemic effect of arachidonic acid. An increase in the level of cholesterol in the plasma of patients with a parallel increase in the concentration of metabolic products of arachidonic acid (lipoxin A4) can be a marker of an active process of
phospholipid peroxidation and disruption of the normal metabolism of arachidonic acid.

A direct relationship was found between the level of total protein and the level of lipoxin A4 (r = 0.34), which may indicate an increase in the total concentration of protein in the plasma of patients due to the constant generation of pro and anti-inflammatory protein components of inflammatory reactions.

Thus, the level of exercise tolerance shown by patients is inversely related to the severity of systemic inflammatory reactions occurring in the body, and a decrease in the activity of the inflammatory process is extremely important for the restoration of physical activity in patients.

**LITERATURE**