

BRONCHO –OBSTRUCTIVE SYNDROME IN THE PRACTICE OF A  
THERAPIST

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Broncho-obstructive syndrome (BOS) is a clinical symptom complex caused by impaired air flow through the bronchi due to narrowing or occlusion of the airways with a subsequent increase in the resistance of the airways to the inhaled air flow. Biofeedback is one of the pathophysiological disorders that can affect the outcomes and progressive course of many acute and chronic bronchopulmonary diseases. BOS, not being an independent nosological entity, can occur in various diseases of the lungs and heart, leading to obstruction of the airways. The main clinical manifestations of BOS are paroxysmal cough, expiratory shortness of breath and sudden attacks of suffocation. Based on clinical manifestations, biofeedback is usually divided into latent and pronounced clinical manifestations. According to the course, biofeedback is divided into acute (suddenly occurring) and chronic (permanent).

Functional changes in biofeedback are associated with a decrease in the main spirometric indicators, reflecting the degree of bronchial obstruction (BO) and the nature of the "air trap", namely:

- forced expiratory volume in 1st second (FEV<sub>1</sub>);
- FEV<sub>1</sub>/FVC ratio <70% (forced vital capacity (FVC))

These indicators are a diagnostic criterion for bronchial obstruction and serve to determine the severity of biofeedback.

Based on the severity of clinical and functional manifestations, BOS is divided into mild, moderate and severe. The main clinical manifestations of BOS are shortness of breath, suffocation (refers to life-threatening conditions), paroxysmal cough, wheezing, noisy breathing. Symptoms are more noticeable with physical activity. Other manifestations of BOS - increased sweating, sleep disturbance, headache, confusion, convulsions - are detected in severe cases of the syndrome complex.

Variant forms of biofeedback

Spastic is the most common variant of BOS (>70% of all cases), the development of which is due to bronchospasm due to dysfunction in the systems controlling bronchial tone.

Inflammatory - the mechanism is caused by edema, infiltration of the airways, hyperemia of the bronchial membrane.

Discrinic - observed with excessive stimulation of enzymes of goblet cells and glands of the bronchial layer, leading to a deterioration in the properties of sputum, dysfunction of mucus formation and mucociliary transport.

Dyskinetic - bronchial patency is impaired due to congenital underdevelopment of the membranous part of the trachea and bronchi, which contribute to the closure of their lumen during inhalation.

Emphysematous - accompanied by collapse (collapse) of small bronchi due to reduction and loss of elasticity by the lungs.

Hemodynamic - occurs secondary to the background of hemodynamic disorders of the pulmonary circulation: with hypertension of the pre- and post-capillaries, congestion in the bronchial veins and with a hypertensive crisis in the pulmonary circulation.

Hyperosmolar - observed when decrease hydration of the mucous membranes of the bronchi (inhalation of cold air), when a high osmotic concentration on the surface of the cells causes irritation of the receptors and bronchospasm .

Bronchial obstruction is based on reversible (functional) and irreversible (organic) changes. The functional mechanisms of bronchial obstruction include spasm of smooth muscles, hypersecretion of mucus and swelling of the bronchial mucosa. Spasm of smooth muscles and hypersecretion of mucus occur as a result of exposure to irritating factors (pollutants , infectious agents) on the mucous membrane of the respiratory tract. In response to this, inflammatory mediators are released, which irritate the endings of the vagus nerve and promote the release of acetylcholine, which realizes its effect through muscarinics . cholinergic receptors . Activation of these receptors causes cholinergic bronchoconstriction and hypersecretion. In the wall of the bronchi there is a sharp congestion of the microvasculature and an increase in their permeability. Thus, swelling of the mucous membrane and submucosal layer develops, their infiltration with mast cells, basophils, eosinophils, lymphoid and plasma cells. The cough can be dry and productive. The initial period of the inflammatory or edematous process is characterized by a dry cough. The appearance of a productive cough indicates a violation of mucociliary clearance and bronchial drainage. Among the infectious agents that most often cause obstructive syndrome are respiratory syncytial virus (about 50%), parainfluenza virus , mycoplasma pneumoniae, and less commonly influenza viruses and adenovirus.

#### Biofeedback treatment

The manifestation of biofeedback, regardless of etiology, requires the doctor to take urgent measures to eliminate bronchial obstruction by influencing its reversible component. It should be noted that the reversibility of bronchial obstruction is determined by the degree of bronchial hyperreactivity (BHR). GRB is defined as the response of the bronchi to various chemical, physical or pharmacological stimuli, when bronchospasm develops in response to an influence that does not cause such a reaction in healthy individuals. The higher the GRB and the duration of exposure to the provocative agent, the more severe and life-threatening the BOS is . In modern pulmonology, there are highly effective methods of delivering drugs directly to the bronchi. This technology is called inhalation nebulizer (from the Latin nebulae - fog) therapy. Its characteristic feature is a high fraction (>80%) of particles ranging in size from 0.5 to 5 microns, which can easily reach destroy the receptor zone in the small bronchi and quickly relieve bronchial obstruction.

The undeniable advantages of inhalation therapy in general are:

- effective creation of high concentrations of medications in the respiratory tract;
- insignificant concentration of the drug in the blood;
- rapid onset of action of drugs;
- possibility of dose adjustment;
- minimum systemic side effects.

The treatment strategy for biofeedback is quite clear and logical. To relieve bronchial obstruction, bronchodilators ( bronchodilators ) are used. Despite the differences in the mechanism of action of various bronchodilators , their most important property is the ability to eliminate spasm of the bronchial muscles and facilitate the passage of air into the lungs.

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