Treatment And Rehabilitation Of Complications Of Bronchial Asthma In A Comorbid State

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***Abstract*—Article is devoted history, status and prospects for the prevention and treatment of purulent-inflammatory diseases of the oral cavity in bronchial asthma mechanisms of action and to use ozone-therapy at various diseases.**

Keywords—bronchial asthma, prevention, treatment, inflammatory diseases, oral cavity, illnesses, not medicamentous treatment.

In recent years, bronchial asthma (BA) in combination with rapidly progressive periodontitis (RPD) has been recognized as one of the most common medical problems among the population, with serious socio-medical and economic consequences, as well as in severe stages leading to disability. Currently, approximately "... the combination of chronic non-specific diseases of the respiratory system and STD is observed in 17.7-28.0% of cases ...". According to the above statements, "…based on data from the World Health Organization, tooth loss from gum disease develops 5 times more often than from complications of caries and ranks second in prevalence, and 85 to 95% of the adult population over the age of 35 suffer from it. ...". Increasing the effectiveness of early diagnosis, prevention and treatment of STDs in chronic obstructive pulmonary disease is one of the urgent problems facing medical workers today [2,20,22].

A number of studies are being conducted in the world aimed at studying the problems of dentistry, such as combined lesions of the periodontium and internal organs. They occupy a prominent place, since this kind of pathology is characterized by a mutually aggravating course of diseases due to the presence of a close functional relationship between the affected organs. At the same time, in patients with BA, rapidly progressive periodontitis is one of the factors that predetermines the unfavorable course of the disease and a sharp decrease in the quality of life (QoL) of patients.The mechanism of RPD in BA still remains unclear and requires further study of the role of local immunity and the progression of RPD. Determination of pathogenetically related aspects of the imbalance of local microbiocenosis, endothelial dysfunction, with ventilation-perfusion disorders of the ventilation capacity of the lungs, psycho-emotional factors of regulation, the development of RPD in BA, assessment of the quality of life, and the development of the main criteria for predicting exacerbations of early diagnosis of RPD are important tasks.One of the problems in medicine, in particular in inflammatory diseases, is the creation of media (including aqueous solutions) that replace antibiotics that stimulate the immune system. In this regard, the ideal substance is ozone as the strongest oxidizing agent, which quickly decomposes and turns into oxygen, which is targeted to the lesion and interacts only with the causative agent of an infectious disease. The fight against infections remains one of the main tasks in many areas of medicine. The growth of resistance to antibiotics of pathogens of nosocomial infections is one of the most serious problems of modern medicine. The resistance of pathogens to antibiotics and the need for systemic treatment create many secondary problems (nephro-hepato- and neurotoxicity), especially systemic toxicity of antibacterial drugs [3,8,20,21,23].

In bronchial asthma, of particular interest is the study of changes in immunological changes, the microcirculatory link of blood circulation at various stages of the development of the disease, which is important not only for a more complete disclosure of the pathogenetic mechanisms of this disease, but also for the development of an adequate treatment complex. Ozone therapy may be one of such methods of therapy for patients with БА. The data of various authors in the field of further increasing the effectiveness of non-drug treatment in patients with asthma using ozone therapy are contradictory to a certain extent. At the same time, it is known that ozone therapy has anti-inflammatory, immunomodulatory, regenerative effects and contributes to the normalization of microcirculation, increasing tissue oxygenation [4,20,21].

Ozone was first described in 1785 by the Dutch physicist Mac Van Marum. In 1832 prof. Schonbein of the University of Basel published the book "Chemical production of ozone". He gave it the name "ozone"

from the Greek "smelling". In 1857 Werner von Siemens designed the first technical installation for the purification of drinking water. Since then, ozonation has made it possible to obtain hygienically pure water. For the first time, ozone as an antiseptic agent was tested by Wolff A., back in 1915 during the First World War. By 1977, more than 1000 drinking water ozonation plants were operating worldwide [15].

Since 1935began to use rectal administration of an ozone-oxygen mixture for the treatment of various intestinal diseases (proctitis, hemorrhoids, ulcerative colitis, fistulas, suppression of pathogenic microorganisms, restoration of intestinal flora). According to Fahmy Z., (1988), in many diseases, one of the leading symptoms of which is pain (migraine, rheumatic diseases, neurological manifestations of osteochondrosis of the spine), the analgesic effect of ozone therapy was obtained [9].

In Moscow in 1992, under the guidance of the Honored Scientist of the Russian Federation, Doctor of Medical Sciences. Zmyzgovoy A.V. the "Scientific and Practical Center for Ozone Therapy" was created, where ozone is used to treat a wide range of diseases. The most important discovery was the discovery (Freberg, Carpendale, 1988) of the antiviral effect of ozone on a culture of lymphocytes infected with HIV-1. The mechanism of HIV inactivation is explained by the following points: 1) partial destruction of the virus envelope and loss of its properties; 2) inactivation of the reverse transcriptase enzyme, which inhibits the process of transcription and translation of viral proteins and, accordingly, the reproduction of the virus; 3) a violation of the ability of viruses to connect to the receptors of target cells. According to Viebahn, the electrophilic ozone molecule can react with the nitrogen free electron pair in M-acetyl-glucosamine, which is found in host cell viral acceptors; this reduces the sensitivity of cells to viruses and eliminates the dependence phenomenon. Moreover, it was found that ozone can inactivate the virus both extracorporeally and inside cells.An important role is played by the activation of the synthesis of the biologically active interferon peptide, which protects uninfected cells from the penetration of the virus. In addition, many infections accompanying HIV turned out to be resistant to antibiotics, but capable of being inactivated by ozone at concentrations that are not toxic to body cells [16].

Studies by a number of authors [20,22] found that the regulation of LPO and AOA processes in the body, apparently, is one of the mechanisms of the therapeutic effect of ozone therapy. Under the influence of ozone, the concentration of glucose in the blood decreases, which, apparently, is associated with an increase in the activity of phosphodihydratase (G-6-PDG) and an increase in its use in hexose monophosphate shunt reactions. In addition, the content of lactate and pyruvate in the blood decreases, which is probably due to the use of these incompletely oxidized products of carbohydrate metabolism in the formation of 2,3-DPG. It has also been found that ozone stimulates the production of cytokines by lymphocytes and monocytes [13].

Morphological studies in the experiment revealed the effectiveness of ozone intervention in the free radical and energy processes of the tumor cell, causing changes in anabolic processes and ultimately its death [2].

The active influence of ozone on the blood coagulation system has been proven - by reducing the concentration of fibrinogen, ozone reduces the aggregation of blood cells and improves its rheological properties. Activation of the fibrinolytic link of the hemostasis system prevents the growth of blood clots, causing partial or complete thrombolysis. Studies by a number of authors [17] revealed an increase in immunity when exposed to a treatment procedure with ozone in chronic hepatitis. Preventive courses of ozone therapy in patients with chronic obstructive pulmonary disease complicated by chronic cor pulmonale create a powerful immune barrier in the human body, as well as correction of endothelial dysfunction of peripheral vessels [5].

In recent decades, parenteral (intravenously, intramuscularly, inside the joint, subcutaneously) administration of therapeutic doses of ozone has been mainly used, the therapeutic effect of which is mainly associated with the activation of various vital systems of the body.

The supply of oxygen to the blood, bypassing the lungs, its increased return by erythrocytes to the tissues, and the improvement of the rheological characteristics of the blood underlie the removal of hypoxia. An increase in oxygen supply leads to the normalization of the functioning of organs and systems. Ozone therapy stimulates the body's anti-infective immune response, contributing to the suppression of the inflammatory process and bronchospastic reaction [22].

According to Zmyzgava A.V., Maksimov V.A. [16] acute and chronic nonspecific inflammatory diseases of the respiratory system, including chronic obstructive pulmonary disease, occupies one of the leading places in the structure of morbidity worldwide. Respiratory diseases are responsible for about 20 billion euros in damage annually, which is the second highest cost among all disease groups in Germany [23,24].According to the World Health Organization, a significant increase in the frequency and mortality from these diseases is expected over the next decade, which requires the search and development of new effective methods of treatment. At the same time, it is known that ozone therapy has anti-inflammatory, immunomodulatory, regenerative effects and contributes to the normalization of microcirculation, increasing tissue oxygenation [4,20,21].

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