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Criteria for Early Diagnosis of Chronic Obstructive Pulmonary Disease in the Background of COVID-19

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Abstract COVID-19 infection in chronic obstructive pulmonary disease Clinical-pathogenetic characteristics of post-transplant complications, criteria for early diagnosis, as well as clinical variants of chronic obstructive pulmonary disease and the pathophysiology of complications developing as a result of the disease are combined with modern knowledge presented in the publications of researchers from different countries.

Keywords COVID-19 is the coronavirus infection of the lungs chronic obstructive disease, Diagnostic criteria, Pathogenesis, Clinic

1. Introduction

Chronic obstructive pulmonary disease (COPD) is one of the pathologies that cause disability and death of patients worldwide, and its rates are increasing day by day (Mannino DM, 2017, GOLD., 2017). The disease is accompanied by signs related to the lungs, as well as serious changes related to other systems. Today, the different methods of research on the prevalence of OSOC may be caused by different approaches to diagnostic criteria and data analysis [4,15]. The severity of the disease can be determined by determining the vital capacity of the lungs by performing breathing tests (spirometry) in the presence of specific symptoms for this disease. In developing countries with a medium or low quality of life, this disease may go undiagnosed due to the insufficient performance of the above tests for all population segments. According to the information provided by the GOLD organization, based on surveys conducted in more than 60 countries of the world, the diagnosis of COPD was made based on spirometry and other diagnostic methods in only 29 countries, and in other countries it was not possible to conduct this method [11,16].

The development of the disease can be determined on the basis of anamnesis data, physical examination, X-ray examination and functional tests. Data from these tests should be differentiated from asthma, heart failure, and bronchiectasis. OSOC developed after COVID-19 can be diagnosed based on the following clinical signs: increased cough, sputum production, increased respiratory muscle activity, decreased blood oxygen saturation in pulse oximetry, increased sweating, tachycardia, restlessness, and cyanosis. Drowsiness can also develop due to the increase of carbon dioxide in the blood. The reason for the development of this condition in a non-smoker is the lack of alpha-1-antitrypsin or professional exposure factors. As the disease worsens, weight loss, pneumothorax, frequent recurrence of decompensation, right ventricular failure, and acute respiratory failure are observed [1,2,5].

CT of the chest (computed tomography) helps to identify other pathological conditions that are not detected by radiography, in particular, concomitant diseases that aggravate the condition: pneumonia, pneumoconiosis, or lung cancer. CT can be used to estimate the extent of emphysema by visual calculation or assessment of the extent of emphysema throughout the lungs. In COPD, CT is indicated, prior to surgery due to reduced lung volume, or in suspected aggravating conditions. In particular, this method is considered a screening method for lung cancer. In addition, if an increase in the size of the ascending artery is detected in this method, pulmonary hypertension is suspected [8,9].

Determination of alpha-1-antitrypsin is of practical importance in non-smoking patients < 50 years of age with clinical signs of OSD. Other manifestations of low levels of alpha-1-antitrypsin are characterized by the presence of OSOC at an early age in the family anamnesis, and the combination of emphysema in the lower lobes of the lungs with ANTsA-positive vasculitis in children due to the observation of liver diseases of unknown etiology. If the amount of alpha-1-antitrypsin is low, the diagnosis should be determined by genetic testing to determine the alpha1-antitrypsin phenotype [12,15].

Determination of hemoglobin and hematocrit in OSOK is of little importance, but the detection of erythrocytemia (hematocrit > 48%) indicates that the patient has chronic hypoxemia. Anemia not caused by OSA is characterized by

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disproportionately severe wheezing. In this case, counting some leukocytes is also of practical importance. For example, the detection of eosinophilia indicates the body's response to inhaled corticosteroids [16,20].

Myocardial infarction as a complication in patients infected with COVID-19 has been found frequently in recent years, and its causes are various. They are: the occurrence of microangiopathy with thrombosis, the development of myocarditis as a result of an increase in the amount of cytokines due to the inflammatory process, and the development of cardiomyopathy caused by stress, acute myocardial infarction, and coronary atherosclerosis, in most cases, not due to thrombotic complications, but microvascular disorders caused by hypoxia are accompanied by the sign of tachyarrhythmias. in turn leads to myocardial ischemia [18,26]. In-depth analyzes revealed that heart damage due to COVID-19 can occur not only in the case of severe complications, but also in people who are actually healthy. In a UK study of 78 student athletes with mild SARS-CoV-2, magnetic resonance imaging showed pericarditis as a result of the disease in 27.1%, and minor changes in myocardial structure and function as asymptomatic persistent myocarditis in 16.7% or their occurrence in a complex form occurs in 12.5% of cases [13,20].

The problem of NCDs is also included in the main development principles of the United Nations (United Nations) in 2030 in the prevention and control of NCDs (non-communicable diseases) according to the global plan of the WHO. WHO develops a series of measures for diagnosis and treatment of OSOK. Taking into account the limited resources of the WHO in the fight against NIK, it is dedicated to disease assessment, diagnosis and chronic respiratory diseases (asthma and COPD) in the fight against NIK at the level of primary medical and sanitary care, as well as counseling patients, promoting them to a healthy lifestyle, giving up harmful habits developed modules [21,24].

"Rehabilitation 2030" is a strategic approach dedicated to the development and strengthening of rehabilitation measures in the healthcare system. Today, the WHO for this condition, based on patient rehabilitation, includes pulmonary rehabilitation. Reducing exposure to tobacco smoke is critical for primary prevention of COPD. The latest conventions of the WHO, MPOWER and mTobacco Cessation organizations against tobacco smoke also serve in this field [7,11].

Other efforts on the prevention front include the Clean Renewable Energy in Households (CHEST) program, which involves the implementation of clean energy technologies at the level of daily life and public policy. encourages the widespread use of the measures he has developed in the fight against it. GARD includes local and international volunteer teams and organizations working to reduce the above-mentioned diseases, which are relevant today [5,24].

It has been proven by medicine that the level of infection and the development of complications with the disease, which has risen to the level of today's epidemic, against the background of OSOK, is higher than in healthy people. Thrombosis is the most common complication of this pathology. Antithrombotic treatment is given as part of the pathogenetic basis of not only prevention of ATE (pulmonary artery thromboembolism), but also its treatment. Thanks to this treatment, the clinical symptoms of the disease and the possibility of slowing down its course are appearing. However, patients with COVID-19 are at increased risk of bleeding, and this risk increases as the disease progresses. An increase in D-dimer in the blood usually indicates activation of the blood clotting system and a high risk of bleeding. D-dimer warrants consideration as a marker of severity of COVID-19 and bleeding risk [17,26].

According to the latest recommendations, every patient with COVID-19 must receive anticoagulant therapy after hospitalization, at least in a dose to prevent thromboembolic complications. The use of higher doses (treatment dose) of anticoagulant drugs in patients without thrombotic/ thromboembolic "macrovascular" complications is an issue of uncertainty and controversy that continues to be determined in randomized controlled trials. The issue of using the above drugs for the prevention of thrombotic complications in all patients undergoing outpatient treatment of COVID-19 or after discharge from the hospital is not completely clear. During the treatment of COVID-19, heparin can be used for other side effects, in particular, anti-inflammatory effect, in addition to its anticoagulant properties, by parenteral administration of heparin. Direct-acting oral anticoagulants are recommended only for patients who are taking these drugs for other indications before this disease or in cases where heparin is not available. Taking into account that activated platelets are also involved in the pathogenesis of thrombotic complications in COVID-19, the acceptability of using antiaggregants (acetylsalicylic acid, platelet P2Y12 receptor blockers, dipyridamole) is being studied today [8,18,28].

In our opinion, the worsening of the situation during the COVID-19 epidemic was caused by the lack of doctors specializing in the treatment of lungs, the lack of competence of doctors in other specialties, and the lack of clarity of treatment measures due to the new onset of the disease. Therefore, on the basis of the conducted research, temporary protocols for the treatment of patients with OSOK and other respiratory infections were developed and treatment measures were systematized. According to these documents, it is necessary to emphasize the identification of the factors causing the disease, differential diagnosis, and the following measures before the disease worsens or its clinical symptoms are evident:

a) if there is no outbreak period, it is necessary to carry out basic inhalation treatment when OSOK or respiratory infections are detected;
b) when arousal period is observed, to apply the treatment according to its severity;
c) recommend the standard acceptable treatment to the patient immediately after transitioning from the arousal phase to the fading phase.

Of course, in the background of OSOK, when COVID-19 is detected, the therapy used during the period of support and

agitation should be carried out based on national protocols and temporary clinical reports [11,24,25,26].

Prevention of OSOK and COVID-19 is very important to identify risk groups and eliminate the factors that cause the disease. Experts from the international GINA (Global Initiative for Asthma) and GOLD (The Global Initiative for Chronic Obstructive Lung Disease) organizations recommend taking basic treatment measures in time before moving to the triggering stage of COPD during the COVID-19 epidemic. In this case, all measures are aimed at controlling the symptoms of OSOK, ensuring that it does not go to the stage of incitement. It is necessary to strictly follow all sanitary hygiene measures (restriction of contact, wear a mask, wash and disinfect hands), get a vaccine against influenza, pneumococcal and coronavirus infection [6,19,27,30].

According to the latest recommendations of the medical communities GOLD and NICE, patients with COPD are recognized as the most affected by this pandemic due to their susceptibility to infection with COVID-19. In order to reduce the possibility of damage to a minimum, it is recommended that they contact medical professionals at the first symptoms of the disease [17,19].

2. Summary

Experts at the COPD Foundation recognize the importance of pulmonary rehabilitation. Taking into account the huge workload of medical institutions during the epidemic, according to the recommendations of national and international pulmonology associations, it is recommended that patients receive medical consultations online with doctors at home using therapeutic physical education and other medical rehabilitation methods [3,4,14,18]. Patients should be given full information about the disease, self-help and treatment, and recommendations to lead an active lifestyle.

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