



Current Perspectives on Exacerbations of Chronic Obstructive Pulmonary Disease During the Covid-19 Pandemic (Literature review)

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Abstract: The review article combines modern knowledge about the origin, pathogenesis, epidemiology, clinical and laboratory diagnostics, as well as therapy and prevention of a new coronavirus infection; the possible relationship of coronavirus infection with chronic obstructive pulmonary disease is described, as well as the likely options for the effect of coronavirus infection on the severity of chronic obstructive pulmonary disease, collected from publications of Russian specialists and researchers from various countries.

Key words: coronavirus infection, COVID-19, chronic obstructive pulmonary disease, pandemic.

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 COPD may be caused by different approaches to diagnostic criteria and data analysis [50].

Its prevalence among the adult population can reach 14.9% in European countries, 15.3% in the Russian Federation, 17.4% in Uzbekistan, and even up to 20% in some countries. According to the WHO, RI (respiratory infections) of the upper respiratory tract took the 3rd and 4th place in the

economically developed countries in terms of death rate between 2015 and 2019. In the countries with low economic opportunities, it took the 1st place. Although the mortality rate of other chronic lung diseases (bronchial asthma is not high), its number is increasing day by day. It is known that respiratory infections of the lower respiratory tract have entered the ranks of infections outside the hospital, causing the death of patients worldwide in 51% of cases in 2021 [34]. Ramirez J. A. _ et al. (2017) in a study of 7,449 patients with a mean age of 65 reported a mortality rate of 6.1%. In the case of hospitalized patients with risk factors (cardiovascular, kidney and oncological diseases), the mortality rate was found to be 3.2 times higher compared to the above [56].

As a result of the research conducted by R. Sabit and his colleagues, the prevalence of OSOK among the middle-aged population is 15% in men and 12.5% in women, and the average is 13.5%. It is one of the main diseases cited as the main reason for consulting a doctor[30,32].

The disease is primarily caused by the unsatisfactory living conditions of the patient, and its consequences can lead to deterioration of his quality of life. In COPD, in addition to inflammation, epithelial dysfunction, airway and lung tissue remodeling are also important. In COPD, the pathological process damages the lower respiratory tract and causes an irreversible process. The frequently observed exacerbation of COPD is distinguished from other diseases by a decrease in the function of lung tissue and a high degree of lethality. In severe cases, respiratory failure and worsening of cardiovascular diseases can even cause death [60].

In December 2019, the new coronavirus infection pandemic that appeared in the Chinese city of Wuhan caused the beginning of a severe epidemiological process, which became a global problem. Due to the fact that the disease primarily affects the respiratory system, it was assumed that patients with COPD have a more severe course of this disease. During the follow-up of patients, they developed respiratory failure, acute respiratory distress syndrome, and a more severe course of the coronavirus disease [22, 77, 80].

it creates the need to start measures in time to prevent the complications that may develop in them . According to the European Association of Pulmonologists, only ¼ of COPD is diagnosed on time, therefore, when this pathology is observed, it is characterized by the fact that late diagnosis can lead to reduced work capacity and disability [2,43 , 105].

COPD is the third leading cause of death worldwide, with 3.23 million deaths due to this disease in 2019. According to estimates, these numbers are likely to double over the next 10 years [1,70,72]. 90% of deaths due to CKD occur in low- or middle-income people over 70 years of age.

Tobacco smoke, indoor air pollution, inhalation of dust, fumes and vapors of chemical agents are important risk factors for the development of OSOK. If we add individual factors to chronic exposure to harmful gases with small dispersed particles (factors affecting lung development in childhood and genetic predisposition), it is considered a favorable environment for the development of this disease. Prolonged exposure to these risk factors can lead to the development of COPD. The subclinical course of the disease can be from 3-4 years to 10 years. During this period, there will be no clear symptomatic

signs, that is why patients do not consult a doctor. Risk factors accumulate in the body over time, causing the development of disease not only in the respiratory system, but also in other systems, as a result of which this condition can confuse the obvious symptoms characteristic of COPD with other symptoms and confuse it with another disease [21, 24, 58, 123, 115].

COPD causes alternate and progressive respiratory symptoms, including shortness of breath, cough, sputum, and general weakness. As the disease worsens in patients with advanced COPD, the quality of life decreases and they cannot perform their daily tasks. Until the symptoms of COPD develop, the patient may require additional treatment at home in addition to hospital treatment, which may cause discomfort to him. Severe attacks can be life-threatening. The lack of importance of gender in the development of this disease has been proven according to the results of scientific work conducted in recent years. But due to the fact that working with harmful chemicals and bad habits among men are more common than women, this pathology is more common in men belonging to this category [81, 104,33].

Patients with COPD often develop comorbidities, including cardiovascular disease, osteoporosis, musculoskeletal disorders, lung cancer, depression, and even psychiatric disorders. If COPD is not treated to the end, by early treatment and diagnosis, it is possible to reduce the development and severity of the symptoms of the disease and the number of exacerbations. 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 [16, 63, 11].

Currently, in the structure of diseases and complications, the decrease in working capacity and death due to disease among older people are of great importance. According to experts, this disease has increased by 58% in recent years. At the same time, in the background of OSOK, when the coronavirus infection, which has reached the level of a pandemic, is added, the disease becomes more severe, the likelihood of developing unpleasant complications increases, and the quality of life decreases. By the end of 2019, the world community faced a new problem. This disease was named COVID-19, and it was found to be caused by the SARS-CoV-2 (Severe Acute Respiratory Syndrome CoronaVirus) virus, which belongs to the family of RNA-storing viruses. The virus has been known to cause disease in humans and some animals. Until 2020 coronavirus was considered a non-severe upper respiratory disease with very low mortality, but as the virus mutated, its lethality was found to increase[94; 103].

The risk group included people over the age of 65, with concomitant diseases (diabetes, cardiovascular, kidney, lung diseases, obesity, immunosuppression, tumor disease). The reason for the higher occurrence of this disease in men is due to the fact that smoking is more common among men [15, 30,68,95].

In addition to the above, the risk group also includes medical representatives, this situation depends on their work with a high viral load of COVID-19. The comorbid condition of COPD and COVID-19 has a negative prognostic effect, which has a negative impact on the patient's life. Quarantine and self-isolation restrict patients from going to medical facilities for treatment and prevention, resulting in worsening of the situation [32, 96].

, a large-scale study was conducted to study the relationship between risk factors and their psychosomatic condition in patients in isolation during quarantine [3,19, 84,]. As a result of the study, it was found that 41% of patients are men and 59% are women, their age is around 30-69. It was recognized that they had at least 1 comorbidity. Standard questionnaires were distributed to them. In this questionnaire, the patient's quality of life, somatic diseases, mental status, arterial blood pressure, pulse, body mass index, and body weight were also indicated. As a result, it was found that during the quarantine, their mental condition worsened, they developed depression, gained up to 15% excess body weight due to reduced physical activity, increased consumption of alcohol products, and lost 2-4% of their work. While 12% of those involved in the study smoked before the pandemic, the number of smokers increased by 1.8 times during the quarantine. During self-restraint, 56% of patients reported mild stress, 34% moderate stress, and 10% marked stress symptoms. Depression was found in 48% of patients with COPD, and all of the above cases lead to aggravating factors of the disease when a patient with this pathology is infected with the coronavirus, it follows that by self-restriction, patients only aggravated the coronavirus pandemic by introducing quarantine measures [1, 97, 116].

It was found that comorbidities of patients with COPD worsened during the course of coronavirus infection, and it was recognized that hypertensive and hyperglycemic crises, thrombosis, and respiratory failure worsened several times. In the second place, it was found that angina pectoris of I-III functional class increased up to 36%. 29.4% of patients with type 2 diabetes developed as a result of the treatment measures carried out in patients with COPD suffering from coronavirus infection. Thus, these patients require special attention compared to others, as COPD is considered a risk factor and a favorable condition for getting sick with COVID-19 [25, 26, 55, 78].

Smoking is a major factor in the development of COPD and it is also a risk factor for infection with COVID-19. 2.4 times more cases of COVID-19 have been recognized among those with COPD. According to a randomized meta-analysis conducted in the USA, the severe form of COVID-19 increased 4.26 times in the presence of COPD. Due to the increased expression of angiotensin-converting enzyme receptors in smoking patients with OSD, the entry of the SARS-CoV-2 virus into the cell becomes easier [57, 35, 117].

From the beginning of the spread of the COVID-19 pandemic, it became known that it has a negative effect on the cardiovascular system and causes the development of various complications. In a study conducted in China, CVD (Cardiovascular) diseases were observed in 76.9% of examined patients, which was 3.9 times less than in patients without the above comorbidities. The mortality rate was 6.92 times higher in patients with coronavirus with this comorbidity, and 13.2 times higher in patients with acute respiratory syndrome, OSOK and coronavirus disease. It was found that even after the treatment of the coronavirus infection, heart disease developed as a complication in 21.4% of those treated at home

and 9.3% of those treated inpatient. The formation of inflammation as an immune response in response to the damage of the blood-vessel and myocardial endothelium of the virus in patients with CVDs suffering from COVID-19, the development of this condition even to the state of "cytokine storm", increased metabolism, impaired microcirculation, and intoxication are characteristic of this infectious process. As a result, conditions are created for endothelial dysfunction, destabilization of atherosclerotic platelets is observed, microcirculation is disturbed, arrhythmia and heart failure develop [6, 118]. On the one hand, this leads to the formation of small fibrin microthrombi, and on the other hand, to the development of small blood vessels (generalized "immunothrombosis"), as a result of which thrombotic and thromboembolic complications develop in small-sized arteries and veins. Due to the fact that it is somewhat difficult to detect microthrombosis during life, the clinical symptoms of COVID-19 in this case are not clear, so in most cases they are detected at autopsy. The frequency of occurrence of macrothrombosis caused by COVID-19 depends on the severity of the disease and the presence of conditions aggravating it due to concomitant diseases [56].

According to the results of a study conducted in Great Britain, lower limb thrombosis occurred in 23% of patients, in 29% of patients treated in the intensive care unit, and in 48% of those who died. 16%, 18% and 24% of patients had pulmonary embolism (PTE). It was found that lower limb thrombosis was found in 37% of cases, and in 52% at autopsy, among those affected by the current coronavirus infection. 29% and 37% of deaths were reported to have COPD [48].

In a meta-analysis of 1012 patients in a study conducted in China, the number of patients diagnosed with COPD was 1.3% of the above. 32% of those with COVID-19 had pre-existing OSA, and 79% of them after the disease. In this analysis, risk factors in patients were also reviewed, and it was confirmed that among those infected with COVID-19, the risk of death was 5.99 times higher in patients with COPD compared to those without this pathology [122].

Based on the above data, it can be concluded that the presence of comorbidities in patients infected with the current coronavirus infection has a negative effect on the course of the disease, and it is necessary to eliminate the risk factors before the symptoms develop.

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