Epidemiological features of covid-19 and post-covid complications.

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ANNOTATION

COVID-19 remains one of the most significant global medical and social challenges of the 21st century, significantly impacting morbidity, mortality, and quality of life. This article examines the epidemiological characteristics of COVID-19 spread, the dynamics of incidence, and the factors determining the severity of the infection. Particular attention is paid to post-COVID syndrome as a new epidemiological phenomenon characterized by the prolonged persistence of clinical symptoms after the disease. The main clinical and epidemiological manifestations of post-COVID complications, their prevalence among different age and social groups, and the impact of comorbidities are analyzed. The medical and social consequences of COVID-19 are highlighted, including decreased work capacity, increased burden on the healthcare system, and the need to develop comprehensive rehabilitation measures. The study results highlight the relevance of further study of post -COVID conditions and the improvement of preventive and treatment strategies.

Keywords: *COVID -19; SARS-CoV-2; epidemiology; risk factors; severe course; post-COVID syndrome; long-term complications; medical and social consequences; public health.*

SUMMARY

The COVID-19 pandemic, caused by the novel coronavirus SARS-CoV-2, has become a major challenge for healthcare systems worldwide. The disease is characterized by high contagiousness , a variety of clinical manifestations—from asymptomatic to severe and fatal—and the development of long-term sequelae following infection. With the virus continuing to circulate and new variants emerging, studying the epidemiological aspects of COVID-19 and post-COVID complications is particularly urgent.

The purpose of this article is to analyze the epidemiological characteristics of COVID-19, factors predicting its severity, and the prevalence and medical and social significance of post-COVID syndrome. COVID-19 is spread primarily through airborne droplets and aerosols, as well as through close household contact. The source of infection is an infected person, including asymptomatic and minimally symptomatic individuals. The incubation period averages 2 to 14 days. Epidemiological studies have shown significant differences in morbidity and mortality rates depending on age, gender, the presence of chronic diseases, and access to healthcare. The highest rates of severe forms and mortality are observed among the elderly. Mass vaccination, social distancing measures , and the implementation of sanitary and epidemiological restrictions have significantly influenced the dynamics of the pandemic.

The severity of COVID-19 is determined by a combination of biological, clinical, and social factors. The main risk factors include old age, obesity, diabetes, cardiovascular and chronic lung diseases, and immunodeficiency states. The body's hyperinflammatory response plays a special role, leading to damage to the respiratory system, cardiovascular system, and other organs. Patients with severe cases often develop acute respiratory distress syndrome, thromboembolic complications, and multiple organ failure. Post-COVID syndrome (long COVID) is a complex of symptoms that persist or arise 4-12 weeks or more after the acute phase of COVID-19. According to various studies, signs of post -COVID syndrome are

detected in 10-30% of those who have recovered, including patients with mild and moderate cases . The most common symptoms are chronic fatigue, shortness of breath, cognitive impairment, sleep disorders, depression, and anxiety. Epidemiologically Post-COVID syndrome is more often recorded in women, middle-aged individuals, and patients with comorbidities. COVID-19 and its complications have a significant impact on public health and the socioeconomic sphere.

Decreased work capacity, an increase in the number of temporarily and permanently disabled individuals, and an increased burden on primary healthcare and rehabilitation services are significant medical and social consequences of the pandemic. Furthermore, an increase in psychoemotional disorders, a deterioration in quality of life, and the need for long-term medical monitoring in patients who have recovered from COVID-19 have been observed. Analysis of epidemiological data indicates that COVID-19 remains a pressing public health problem, and post-COVID syndrome creates a new category of patients requiring a comprehensive and interdisciplinary approach. Further epidemiological research is needed to clarify risk factors, the mechanisms underlying the development of post-COVID complications, and the development of effective preventive and rehabilitation programs. Post-COVID syndrome (PCS, Long COVID) is a complex of clinical symptoms and functional impairments that persist or first emerge after COVID-19 coronavirus infection.

According to the World Health Organization, the post-COVID state typically develops 3 months after the onset of the disease, lasts at least 2 months, and cannot be explained by an alternative diagnosis. With the continued circulation of SARS-CoV-2, PCS is acquiring significant epidemiological and medical-social relevance. According to international epidemiological studies, the incidence of post-COVID syndrome varies from 10 to 30% among all COVID-19 survivors. In patients who have experienced moderate and severe forms of the disease, especially those requiring hospitalization and intensive care, the prevalence of PCS reaches

50–70%. However, post- COVID symptoms are often detected in individuals after a mild or even asymptomatic course of the infection, significantly expanding the scope of the problem. From an epidemiological perspective, post-COVID syndrome is characterized by a variety of symptoms and damage to various organs and systems. The most common symptoms include asthenic syndrome and chronic fatigue (up to 80% of cases), respiratory disorders (shortness of breath, cough), cognitive impairment (brain fog, memory loss), psychoemotional disorders (anxiety, depression, sleep disorders), and cardiac and metabolic manifestations.

The multiplicity of symptoms complicates the recording and standardization of epidemiological data. Post-COVID syndrome creates a new cohort of patients with chronic conditions, increasing the burden on the healthcare system. It negatively impacts quality of life, productivity, and social adaptation of the population. In terms of epidemiology, post-COVID syndrome requires the implementation of long-term monitoring systems, the development of rehabilitation programs, and an interdisciplinary approach to patient management .

Post-COVID syndrome is a significant epidemiological problem of our time, characterized by high prevalence, a multifactorial nature, and long-term medical and social consequences. A comprehensive study of the epidemiological aspects of post-COVID syndrome is necessary to improve preventive measures, optimize medical care, and develop effective rehabilitation strategies. Severe COVID-19 remains one of the key problems in modern medicine, determining the level of hospitalization, mortality, and the burden on the healthcare system. Numerous clinical and epidemiological studies have shown that the severity of the disease is determined by a combination of demographic, clinical, biological, and social factors.

The presence of chronic pathology significantly increases the risk of complicated COVID-19. The most significant are cardiovascular diseases (arterial hypertension, coronary heart disease); diabetes mellitus; chronic lung diseases (COPD, bronchial asthma); obesity; chronic kidney disease; oncological diseases. Comorbidity contributes to the development of respiratory failure, thrombotic

complications and multiorgan Dysfunctions. Immunological and metabolic factors. Decreased immune protection, including congenital and acquired immunodeficiencies, increases the likelihood of a severe course of infection. Patients with obesity and metabolic syndrome have chronic inflammation and impaired cytokine response, which can lead to the development of a " cytokine storm." Clinical and laboratory predictors.

Unfavorable prognostic factors include: high body temperature and severe shortness of breath on admission; decreased oxygen saturation; lymphopenia ; increased levels of C-reactive protein, D- dimer , ferritin , and interleukin-6. These indicators reflect the degree of systemic inflammation and the risk of thromboembolic complications. Social and behavioral factors. Smoking, low socioeconomic status, late seeking of medical care, and limited access to health services also contribute to the severity of COVID-19. Failure to comply with preventive measures increases the viral load and the risk of severe forms of the disease. Severe COVID-19 disease is influenced by a combination of factors, including age, gender, underlying medical conditions, immune status, and social conditions. Identifying high-risk patients is crucial for early hospitalization, personalized treatment, and reduced mortality. Consequences. The pandemic has led to a decline in quality of life, disruption of social connections, and limitations in work activity. As a result, the number of people temporarily and permanently disabled has increased, contributing to a rise in disability. Restrictive measures, distance learning and remote work have had an impact on the level of education, professional adaptation and social mobility of the population.

Economic Consequences. The economic damage associated with COVID-19 manifests itself in increased healthcare costs, decreased productivity, and increased unemployment. The additional burden on state budgets is due to the need to finance treatment, vaccination, rehabilitation, and social support programs. Medical and social significance. The combined medical and social consequences of COVID-19 require a multidisciplinary approach, including prevention, early

diagnosis, rehabilitation, and psychosocial support. Developing effective programs for the recovery and social adaptation of those who have recovered is a priority for modern healthcare. The medical and social consequences of COVID-19 are complex and long-term, affecting the physical, mental, and social well-being of the population. These consequences must be taken into account when planning a public health strategy aimed at mitigating the negative consequences of the pandemic and improving the quality of life of the population.

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