



POST-COVID SYNDROME LESION OF THE OSTEOARTICULAR SYSTEM

1. Khalimova Dilrabo Jalilovna
2. Khamidova Zaynab Norovna
3. Khamdamova Gulkhayo Rakhmat Qizi

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¹ Assistant of the Department of Internal Medicine of Bukhara State Medical Institute named after Abu Ali ibn Sina

² Associate professor of the Department of Internal Medicine of Bukhara State Medical Institute named after Abu Ali ibn Sina

³ Assistant of the Department of Internal Medicine of Bukhara State Medical Institute named after Abu Ali ibn Sina

Annotation: There are no general recommendations for the treatment of postcovid in the world yet. The Ministry of Health last year approved recommendations for the rehabilitation of patients, but these are temporary manuals. And still not all doctors and not all patients know about postcovid and its symptoms. And while doctors and scientists are studying the diagnosis, doctors suggest that patients carefully study themselves. With long-term symptoms of postcovid, you need to go to a specialized specialist: an endocrinologist, gastroenterologist, neurologist or psychiatrist, if there are signs of depression.

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According to the expert, all these symptoms are due to the fact that the virus actively affects various systems of the human body. Most often it affects the brain, causing disturbances in certain areas of it responsible for the sense of smell and taste. The duration of the preservation of these changes depends on the degree of damage. Someone may have only a sense of smell, others stop feeling the taste, and for some the recovery period is delayed for several months.

In addition, doctors often identify post-viral asthenia syndrome – this condition is accompanied by weakness, lethargy and irritability and malaise. The reason is that coronavirus infection produces a large amount of biologically active substances - cytokines. On average, 75 people for every 100,000 COVID-19 cases have a cytokine storm, the waves of which can accompany a person for quite a long time.

Most patients with confirmed coronavirus have lung damage. With a mild course – 8-10%, with an average – 50%, with severe - 75-95%. And here the danger lies in the fact that the lungs, even after recovery, cannot fully restore their function. There is a possibility of fibrosis formation, which interferes with normal gas exchange. At the same time, a person can breathe, but oxygen saturation will be insufficient. This problem must be kept under control, it is advisable to undergo an additional examination by a pulmonologist and get the necessary recommendations.

The cardiovascular system is also under covid's sights. As for the heart itself, the main serious complication here is the development of myocarditis - inflammation of the heart. In addition, the conduction of the heart muscle may be disrupted. Blood clots can form in small vessels, and to prevent microthrombosis, experts recommend taking anticoagulants that reduce blood clotting even on outpatient treatment. To date, these drugs are one of the main ways to treat coronavirus infection.

Another symptom of the "postcovid syndrome" is a mood disorder. Some patients - especially those with a severe course of the disease - become irritable, aggressive, many develop depression and even fear of death – that is, the virus affects the mental sphere quite seriously. All this is due to lesions of the human brain and nervous system. And if after recovery you still have violations of smell, taste, mood, memory, fatigue, insomnia and panic attacks, then the coronavirus has left its mark in the body.

Most people infected with SARS-CoV-2 recover completely within a few weeks. However, it happens that the symptoms do not completely disappear, or even after a mild course of the disease, the patient reports various complaints for weeks. The authors of this study also suggested that the criterion of laboratory confirmation of SARS-CoV-2 infection was not a prerequisite for the diagnosis of long-term or chronic COVID-19, since many people do not undergo testing or tests give false negative results, although clinical symptoms and epidemiological history indicate COVID-19. In turn, the National Institute for Health and Care Excellence (NICE), in an agreement with the Scottish Intercollegiate Guidelines Network and The Royal College of General Practitioners, in its recommendations on October 30, 2020, for the first time described the following forms of COVID-19 :

- 1) acute COVID-19 (acute COVID-19) — complaints and symptoms of COVID-19 lasting up to 4 weeks
- 2) ongoing symptomatic COVID-19 (ongoing symptomatic COVID-19) — complaints and symptoms of COVID-19 lasting from 4 to 12 weeks
- 3) post-COVID-19 syndrome - complaints and symptoms that develop during or after COVID-19 and last >12 weeks and are not the result of another diagnosis.

According to the estimates of many authors of scientific publications on this topic, approximately 10-20% of people who have had COVID-19 report poor health and incomplete recovery within > 3 weeks after the illness, and 1-3% still after 12 weeks. However, multicenter surveys show that this percentage is

higher than 5. Many patients who require hospitalization for COVID-19 are discharged from hospitals until they fully recover. In a group of 384 people studied by Mandal et al. (average age 59.9 years, 66% with concomitant diseases), on average, complete recovery occurred approximately 90 days (median) from the onset of the disease. 53% of people reported shortness of breath, 34% reported coughing, 69% reported fatigue, and 14.6% had depression. Of the 244 patients who underwent a control RG study, only 62% had a completely normal image. 2% had no improvement, and 9% had a significant deterioration requiring further pulmonological diagnosis.² However, it turns out that people who have been diagnosed with a mild form of the disease and do not have comorbidity also experience prolonged ailments after infection with SARS-CoV-2. In a telephone survey conducted in the United States among adults with laboratory-confirmed infection and outpatient treatment of COVID-19, up to 35% of people reported that within 2-3 weeks after testing for COVID-19, they still had not returned to their normal health condition. This also applies to young people and people without comorbidity. Among previously healthy people aged 18-34, one in five did not return to normal health during this time.

Disorders of the coagulation system and metabolic disorders, such as difficulties in achieving control of diabetes mellitus, were also observed. There are also documented consequences of SARS-CoV-2 infection, such as myocarditis and cardiovascular insufficiency, arrhythmias and thrombotic complications. Postinfectious encephalitis has also been reported. The same symptoms from the respiratory system, musculoskeletal system, nervous and other systems have also been described in infections caused by other coronaviruses that cause severe infections (SARS and MERS). The cause of the persistent symptoms is unknown, but is probably related to several different pathophysiological mechanisms, including an inflammatory reaction with a component of vasculitis. The authors of this article also encountered reports of visual impairment in some patients with COVID-19, as well as arthritis that persisted for several weeks after infection with SARS-CoV-2.

It is proposed that patients who have undergone COVID-19 should be examined by a family doctor, and that the decision on the type of laboratory and imaging studies and specialist consultations should be based on information obtained as a result of an objective and subjective examination. Additional studies are not always necessary, but they can help determine the cause of symptoms and exclude severe complications, such as myocardial infarction, thromboembolism, etc.

The authors' recommendations also note to immediately refer for urgent diagnosis persons with symptoms that may indicate potentially life-threatening complications, including severe hypoxemia during exercise, symptoms of severe lung disease, chest pain and multisystem inflammatory syndrome (in children). Patients reporting persistent or intermittent shortness of breath, they should be additionally checked for latent hypoxia.⁸ The patient can monitor blood oxygen saturation (SpO₂) independently at home using a pulse oximeter for 3-5 days. In addition, it is possible to evaluate SpO₂ at rest and (if there are no contraindications) after performing squats as quickly as possible for 1 minute.

Despite significant progress in the diagnosis and treatment of diseases of the circulatory system, cardiovascular mortality in Russia continues to be one of the highest in the world, and against the background of the COVID-19 pandemic, this indicator has increased significantly.

Until recently, research in the field of COVID-19 has mainly focused on epidemiology, risk factors for severe disease and determining optimal management strategies for hospitalized patients. However, there is increasing evidence that COVID-19 can cause serious disorders of the cardiovascular system that last for more than three months after the disease. Currently, this new condition is classified as postcovid syndrome, but its clinical characteristics, pathophysiology and corresponding treatment strategy remain largely unknown. Patients with postcovid syndrome have a wide range of symptoms, including fatigue,

chest pain, decreased exercise tolerance, cognitive impairment, shortness of breath, prolonged fever, headache, loss of sense of smell and taste, sleep disorders, and many others. One of the most frequent complaints of patients who have undergone COVID-19 are palpitations and heart

failure.

In addition to the proposal of an international group of scientists to single out postcovid tachycardia syndrome as a new independent condition after acute COVID-19, the researchers described in detail the issues of epidemiology, the proposed mechanisms, possible treatment options and future directions of clinical and fundamental research of this new clinical syndrome.

The authors of the new study propose to consider postcovid tachycardia syndrome as an integral phenotype of disorders of the autonomic nervous system, underlying most manifestations of postcovid syndrome. It is also important that the heart rate is an easily measurable quantitative parameter that clearly correlates with the severity of post-ovoid syndrome.

"Currently, the development of an observational study protocol aimed at determining the frequency of post-ovoid tachycardia after recovery from COVID-19, as well as a new approach to its treatment, is being finalized. Unlike the existing rehabilitation protocols after the disease, the treatment regimen being developed will include drugs of several pharmacological groups aimed at restoring disorders of the cardiovascular and nervous systems. The monitoring of patients' condition will be carried out, among other things, by a telemedicine system for remote monitoring of vital parameters, also developed by the staff of the Moscow State University Medical Center. Such an approach will preserve health and ensure a normal quality of life for many patients with postcovid syndrome," Professor Simon Matskeplishvili added.

Anyone who has suffered a coronavirus infection can develop post-corneal syndrome.

Rehabilitation programs for patients are based on a modern evidence base and are aimed at regressing disorders, restoring the functions of organs and systems damaged during the coronavirus infection.

These long-term symptoms include problems that occur in waves or on an ongoing basis:

- paralyzing weakness,
- shortness of breath, incomplete inhalation, heaviness behind the sternum;
- headache, muscle pain, joint pain;
- loss of sense of smell, distortion of smell, taste;
- hair loss, tooth loss, cystic formations in the jaw cavity;
- skin reactions (rash, extensive urticaria, capillary nets);
- sudden jumps in blood pressure and pulse, dizziness;
- memory loss, "fog in the head", disorientation in space, sleep disorders, anxiety and panic attacks;
- disorders of the gastrointestinal tract, diarrhea;
- prolonged increase or decrease in body temperature, or temperature jumps.

Direct damage to the patient's organs. The SARS-CoV-2 virus directly damages the cells of the lungs, heart, blood vessels, brain, kidneys, stomach and intestines.

Blood clots. The virus causes inflammation of the inner lining of blood vessels (endothelium, vasculitis), which causes problems with blood clotting. The presence of microthrombs in the bloodstream disables abundantly supplied organs, such as the heart, kidneys, adrenal glands, thyroid gland, sex glands, brain and others.

The virus is neurotropic, damages brain cells and major nerves, causing a wide variety of symptoms, from sleep problems and anxiety disorders to cardiac and respiratory arrhythmias.

The virus causes an excessive immune system response. Autoimmune reactions are provoked. Chronic inflammation occurs due to the activation of mast cells, which secrete a large number of mediators.

According to him, the duration of the syndrome is usually up to 4.5 months from the moment of occurrence. Its most frequent manifestations are impaired lung function, including shortness of breath, and non-regenerating oxygen saturation. Up to 70% of patients face such symptoms.

At the same time, the infectious disease specialist noted that the course of the disease does not directly affect the severity of the postcovid syndrome, but the immune system does. So, a patient with a weakened immune response usually tolerates coronavirus more easily, because the body will not react sharply. However, this factor contributes to the prolonged stay of infection in the body, which increases the damage to systems and organs.

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Postcovid syndrome is a generalized diagnosis that can include a variety of consequences of a coronavirus infection. Among the main symptoms with which ill patients turn to doctors are rapid fatigue, increased anxiety and irritability, memory disorders, shortness of breath, blood pressure disorders and other cardiovascular complications; exacerbation of chronic diseases.

As specified in the demand for individual (outside of rehabilitation programs) services that patients seek after undergoing coronavirus has increased significantly — these are CT diagnostics, consultations of pulmonologists, studies of the function of external respiration.

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