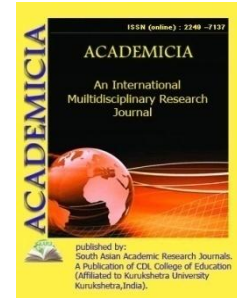




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## SCARS ON THE LUNGS: PULMONOLOGIST ON HOW TO PREVENT FIBROSIS AFTER COVID PNEUMONIA

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### ABSTRACT

*This article examines the post-Covid state of patients who have undergone COVID-19 who have complications such as post-Covid fibrosis. The article gives recommendations to patients on the rehabilitation of the post-like state in order to fully restore health.*

**KEYWORDS:** *Rehabilitation, Complications*

### INTRODUCTION

Dangers of viral inflammation

They differ from bacterial pneumonia primarily in the prevalence and nature of inflammation. As a rule, these are bilateral poly-segmental pneumonia. The term “covid pneumonia” is even more suitable for the term “viral covid pneumonitis”. Such inflammation in the lungs proceeds differently - with the development of interstitial inflammation (that is, affecting the walls of the alveoli and the connective tissue of the lung. - Ed.) And thrombosis of small pulmonary vessels, the formation of such a complication as pneumo-fibrosis. And it requires longer treatment than bacterial pneumonia, an early start of rehabilitation measures, and their continuation even during

the period of aftercare and recovery.

Against the background of a viral infection, damage to the wall of the pulmonary alveoli, pulmonary interstitium, involved in a gas exchange of small vessels (which causes vasculitis, micro thrombosis). The nature of the inflammation is different than bacterial pneumonia - there the alveoli are filled with liquid or purulent secretion, but this is not the case here. It takes a certain amount of time to aggravate bacterial pneumonia, and with viral pneumonia, lung damage can be lightning-fast and lead in the future to severe fibrosis. The risk of developing fibrosis in the lungs is higher in patients with extensive lung lesions, in those who have undergone mechanical ventilation, in patients with concomitant pathology (diabetes mellitus, obesity, hypertension).

Fibrosis in the lungs can be accompanied by persistent coughing, fatigue and poor tolerance to normal physical activity.

The course of covid pneumonia is unpredictable, it is impossible to say in advance how the disease will develop in a particular person. Sometimes pneumonia with initially small lung damage is severe, with rapidly increasing symptoms and volume of damage to the lung tissue, up to life-threatening complications and death.

Scars can cause respiratory failure

The main target of coronavirus infection is the lungs, therefore, viral pneumonia, especially severe, with a large lesion, invasive ventilation of the lungs during treatment can result in fibrosis in the lungs. Fibrosis is a consequence of the inflammatory process when the lung tissue is replaced by a connective tissue scar. In common parlance, this is a scar on the lung. If it is small, then the lung function and gas exchange will not be affected. If fibrosis is extensive, bilateral, with damage to several segments or even lobes, then in the future this can lead to irreversible changes in pulmonary function, respiratory failure, up to disability.

After suffering Covid, patients complain of shortness of breath during normal physical activity, it does not go away for several weeks or even months (shortness of breath can still be a manifestation of a post-Covid asthenic syndrome). Also, fibrosis in the lungs can be accompanied by a constant unproductive cough, fatigue, and poor tolerance to normal physical activity. The most informative method for assessing the prevalence of fibrosis is computed tomography of the chest organs. In addition, doctors prescribe body plethysmography (study of the ratio of different lung volumes), spirometry (a method that allows you to estimate the volume of inhaled and exhaled air), since the vital capacity of the lungs with pneumofibrosis can be reduced.

There are no highly effective, universal drugs for the prevention of fibrosis; it is necessary to start non-drug prevention methods as soon as possible. First of all, it is therapeutic breathing exercises. There are many breathing techniques: remedial gymnastics according to Strelnikova, Buteyko, yoga breathing. You can use your own breathing simulators: blowing air through a tube into a glass of water. Do this exercise for 10 minutes three times a day.

It should be noted that the breathing exercise loved by many - inflating balloons - is prohibited in the acute period of the disease, since there is a risk of damage to the inflamed lung tissue, up to the development of pneumothorax. But during the aftercare period, chest massage, physiotherapy

procedures (but taking into account contraindications) are very useful.

Physical activity should be dosed. During the aftercare period, walking, Nordic walking (where the upper shoulder girdle is involved, movements help to improve drainage function and blood flow in the lungs) are very useful. But heavy physical activity should definitely be avoided since the body needs to be given time to recover from a severe infection. It is also forbidden to breathe essential oils, which can settle in the lungs, disrupting blood supply and gas exchange in them. You can not breathe aggressive non-medicinal preparations, alcohol solutions, soda. And our people are very fond of self-medication. By the way, many of those who have had a hard time covid, subsequently quit smoking - due to pronounced respiratory discomfort and shortness of breath and even experienced smokers.

A third of the tests are false negative

Unfortunately, false-negative tests are not uncommon. Approximately every third patient with pneumonia we have with a false-negative PCR test for COVID-19, and there are patients who have been repeatedly tested. There may be several reasons: violation of the timing and technique of taking smears, the unpreparedness of the patient (certain conditions must be met). With the development of covid pneumonia, tests may well show a negative result, because the virus has already penetrated far into the lower respiratory tract and in the upper, where the smear is taken from, it may no longer be there.

About one in three pneumonia patients have a false negative PCR test for COVID-19.

Viral pneumonia is radiographically different from bacterial pneumonia. And from the picture, we can say with a high degree of confidence that this is covid pneumonia. It has certain radiological features, the so-called "ground glass" symptom, changes are bilateral, located subpleural, and affect several segments of the lungs. In addition, patients describe symptoms characteristic of coronavirus infection that cannot be confused with other viral diseases. All patients say: "This was the first time in my life." If a patient wants to make sure that he has suffered from coronavirus pneumonia, we recommend that he be tested for antibodies. And in 99 percent of patients, these antibodies are detected.

For the first 6-8 months after covid pneumonia, people are protected from re-infection, they develop antibodies and develop immunity. By the way, we also have another type of immunity - cellular, which also protects against viral infections. Against the background of weakened immunity after coronavirus, you can contract any other viral infection that has not disappeared from your life and spreads seasonally.

Based on a CT scan of the chest, doctors can say with a high degree of confidence that pneumonia is a coronavirus, even with a negative test for COVID-19.

It is extremely difficult to protect against infection, as well as to predict the course of coronavirus infection. I believe that the risk of developing complications from vaccination is lower than the risk of a severe course of coronavirus infection and its complications. And I meet with complications in my practice every day, and these are not only pneumonia but also myocarditis, pericarditis, cardiac arrhythmias, polyneuropathy, neuropathy of the facial nerve, venous thrombosis, and more.

Rehabilitation of patients

It is necessary to use therapeutic exercises, chest massage, physiotherapy procedures, if necessary, drug therapy. These are not only patients after pneumonia, but also patients with the post-vein asthenic syndrome, mild post-vascular complications from the nervous, cardiovascular system.

If the patient is not suitable for the rehabilitation program. If there are decompensated chronic diseases of the lungs, heart, rhythm disturbances, any acute diseases until recovery. Already about 100 people are undergoing a rehabilitation course.

## CONCLUSION

To protect yourself from covid pneumonia and other lung infections, you need to:

- get vaccinated against influenza annually, get vaccinated against coronavirus infection, then get vaccinated against pneumococcal infection (pneumococcus - the most common causative agent of bacterial pneumonia);
- Stop smoking - the less aggressive effect on the respiratory tract, the better;
- Timely sanitize chronic foci of other infections;
- Play sports, if possible, lead an active lifestyle (athletes rarely get severe covid pneumonia, and they usually do not have fibrotic changes in the lungs);
- eat properly and fully, take preventive courses of vitamins and mineral complexes;
- humidify the air in the house;
- continue to wear masks, treat hands with antiseptic, avoid crowds of people.

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