



## Polypragmasia as a risk factor causing complications in viral infection

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**ABSTRACT:** Diverse clinical symptoms combined with limited possibilities of etiotropic therapy, a large number of symptomatic agents became the reasons for polypharmacy in the treatment of coronavirus infection. Unreasonable treatment often slows down the natural healing process. In the majority of patients with coronavirus infection, the disease occurs in a mild or moderate-severe form, approximately 25% develop a severe disease that requires oxygen support [2,3], and 5% have an extremely severe course with complications such as acute respiratory distress syndrome, respiratory failure, septic shock, thromboembolism, sepsis, multiple organ failure, acute kidney and heart damage. Smoking, old age and concomitant diseases, such as heart disease, chronic lung disease, hypertension, diabetes, multiple comorbidities have led to what is currently relevant-polypragmasia. This term refers to the simultaneous unjustified administration of a large number of medications.

**Key words:** polypharmacy, risk factor, coronavirus infection.

## Introduction.

To date, there are about 250 viruses of different varieties that cause the typical symptoms of acute respiratory viral infection: 4 metapneumoviruses, 45 serotypes of adenovirus, 115 serotypes of rhinovirus, 3 syncytial viruses, 4 reoviruses, 7 parainfluenza, 27 enteroviruses, 2 coronaviruses, 3 influenza, bocavirus and others. Over time, scientists discover more and more new strains. The main causative agent of coronavirus infection is the SARS-CoV-2 virus, which was first detected in Wuhan, China, in December 2019 [1, 2]. The results of a genetic study of the coronavirus indicate that it is a

betacoronavirus closely related to the SARS virus. By definition, a clinical case of caronavirus is a case of a disease with the presence of symptoms characteristic of caronavirus. [3,4].

### **Main part.**

Most often, caronavirus in patients proceeds in a mild form and can end without the use of any medications. However, in some cases develop after a hard state, accompanied by various complications [6,7]. Injuries from this disease ranged from blockage of blood vessels in the alveoli to scarring of the lung tissue. This condition is called pulmonary fibrosis and can lead to respiratory failure. Currently, there are no ways to stop the developing fibrotic process in the lungs [9, 10].

A potentially fatal reaction of the body is a cytokine storm that triggers an uncontrolled activation of the body's immune cells, which leads to the destruction of tissues in the focus of inflammation. This reaction is observed in some patients with coronavirus. In particular, there is inflammation of the heart muscle (myocarditis), which knocks down electrical impulses, leads to arthymia and disrupts blood circulation, causing respiratory failure [7].

Myocarditis can develop not only at the peak of the infectious process, but also after the extinction of the main symptoms of the disease. Its nature is an autoimmune process in the myocardium. It also develops in some patients with cardiomyopathy. The thrombosis that develops with the coronavirus can continue even after recovery. Previously formed blood clots may also come off. These manifestations in most cases cause the appointment of a complex of drugs for pathogenetic and symptomatic therapy: paracetamol, diclofenac, ibuprofen, anticoagulants, antiplatelet agents, antibiotics, glucocorticosteroids, antiseptics, mucolytics and expectorants [8].

Most often, with a dry cough, which naturally develops at the beginning of the disease against the background of rhinopharyngitis, antitussive medications are prescribed. This action relieves the symptoms, but the multiplication of pathogens continues and the infection spreads to the underlying respiratory tract. This condition contributes to the development of complications such as bronchitis, bronchiolitis, and pneumonia [5, 6].

For respiratory tract infections, antihistamines are also prescribed, but currently there is no proven therapeutic effect on the symptoms of caronavirus, and in some cases, a negative effect on the condition of the mucous membranes of the respiratory tract [1, 7]

The use of antipsychotic drugs to relieve arousal in caronavirus infection was also recommended, but we should not forget about the side effects that can negatively affect the patient's condition, including sedation, suppression of the respiratory and cardiovascular systems, the risk of fever or other immunological disorders, blood clotting disorders, and any potential drug interactions between these and other drugs. [2, 9]

Muscle and joint pain, increased body temperature, headache are forced to prescribe anti-inflammatory drugs. Lymphadenopathy, which is often detected in viral infections, becomes a reason for including homeopathic formulations with a targeted effect on the lymph nodes in the scheme, although the effectiveness of this approach does not have a sufficient evidence base [9].

According to a systematic review and meta-analysis of the effect of corticosteroid therapy on clinical outcomes in individuals infected with SARS-CoV-2, SARS-CoV, and MERS-CoV viruses, corticosteroids did not significantly reduce the risk of death, did not reduce the duration of hospitalization, the frequency of hospitalization in the ICU, and the use of ventilators, and at the same time caused a number of side effects [8]. The results of a systematic review of corticosteroid use in patients indicate a lack of survival benefits and potential harm (5). The results of a systematic review

of influenza observational studies indicate a high risk of mortality and secondary infections when using corticosteroids, the quality of evidence was assessed as low or extremely low due to the influence of distorting factors associated with clinical indications for prescribing drugs [3, 4]. A follow-up study that looked at this limitation, taking into account time-varying distorting factors, found no effect on mortality [6, 7]. In a recent study of patients treated with glucocorticosteroids, no effect of glucocorticosteroids on mortality was found and a slowdown in viral reproduction was noted [8, 9]. Due to the lack of effectiveness and potential harm, corticosteroids should be avoided on a regular basis, unless they are prescribed for another reason. These other causes may include exacerbation of asthma or chronic obstructive pulmonary disease, septic shock, and individual patients may need to conduct a benefit-risk analysis.

When using antibacterial agents, modern guidelines recommend adding probiotics to the standard treatment regimen to correct possible dysbiotic disorders. Sometimes, doctors still recommend using antifungal medicines as a preventive measure, which in recent years has been considered unjustified. A doctor may prescribe more than ten medicines when prescribing medicines. In such a situation, it is difficult to correctly assess the interactions of drugs with each other and determine the risk of adverse reactions [2], which increases with drug interactions. When indicating such a number of drugs, it is desirable to give the right amount to the most effective drugs with the least side effects. However, improper use of drugs provokes unforeseen drug interactions. As a result, chemical reactions occur not only between the original ingredients of the drugs, but also their active metabolites. This causes the formation of highly allergenic complexes.

Of course, correctly and correctly selected combinations of drugs (taking into account the characteristics of the drug, its interaction with other drugs, the necessary dosage and timely correction) can improve the quality, life expectancy and recovery period. At the same time, thoughtless administration of a large amount of similar pharmacodynamic efficacy of drugs can lead to a high risk of developing adverse consequences that will cause hospitalization or even death.

Therefore, the correct selection of effective medicines for the treatment of coronavirus infection allows you to avoid polypragmasia, reduce the time spent in the hospital and improve the recovery time.

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