

Short Communication

Plasmapheresis for Treatment and Prevention of Late Pulmonary Complications in COVID-19 Infection

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The COVID-19 pandemic affected more than 20 million people on Earth, of which more than 700,000 people died. However, even among the survivors, many have long-term consequences, with prospective serious health disorders.

The lungs are most often affected. In severe cases, acute respiratory distress syndrome (ARDS) develops such as toxic pulmonary edema with severe and difficult to correct the respiratory failure, which requires even extracorporeal membrane oxygenation. The main pathogenetic factor, in this case, is endotoxemia with the development of toxic interstitial, and then alveolar pulmonary edema due to the affected permeability of the cell membranes [1]. Activation of microbial infection with COVID-19 infection indicates a weakening of the body's immune defense system, its inability to cope with the pathological condition on its own. Respiratory viral infection contributes to immunosuppression even more, especially in patients weakened by chronic diseases, and intoxications.

At the same time, you can observe several immune disorders with an increase in the levels of C-reactive protein, IL-6, IL-8, as well as TNF- α , impaired T- and B- cell immunity [2, 3]. With this

coronavirus infection, many toxic substances accumulate in the blood, up to a "cytokine storm" [4]. The main damage occurs in the vascular endothelium, leading to their porosity and release of not only fluid but also endotoxins into the interstitial space. With the development of such toxic vasculitis in the lungs, an acute inflammatory reaction occurs in the form of toxic edema that is the respiratory distress syndrome [1].

Already during the disease, serious disorders of all elements of their parenchyma are formed in the lungs with the development of small pulmonary vessels thrombosis, consolidation, and fibrosis in the later stages [5-7].

Such immune disorders do not go unnoticed. And after the cure, quite serious disorders remain associated with the formation of idiopathic pulmonary fibrosis. Thin-layer computed tomography reveals (parenchymal band, traction bronchiectasis, and irregular interfaces [8, 9].

There is a lot of evidence to support the autoimmune nature of such long-term complications after COVID-19 infection. One of the factors contributing to them is the affinity of the antigenic structure of the proteins of the virus and humans [10, 11]. Besides, disruption of the antigenic structure of damaged lung cells is a stimulus to form autoantibodies against them. And if viruses and microbes subsequently disappear from the body and the formation of antibodies against them subsides, then their damaged cells remain in the body forever, which is the stimulus for further formation of an autoimmune disease such as idiopathic pulmonary fibrosis, which will also develop for many years with symptoms increasing respiratory failure, up to the lethal outcome [12].

The severity of the complications caused makes it necessary to undertake serious measures for the rehabilitation of such patients after their recovery [13-17].

Given the autoimmune nature of these complications, it is most advisable to use plasmapheresis, with help of which not only autoantibodies and cytokines can be removed, but also many other toxic substances accumulated during the illness, including hepatic- and nephrotoxic drugs [18-19]. And if you use these methods of extracorporeal detoxification during an illness, you can prevent critical conditions and all long-term complications.

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