



PLASMA EXCHANGE IN PREVENTION AND TREATMENT OF COVID-19 RELATED ACUTE KIDNEY INJURIES

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Abstract:

The COVID-19 pandemic has covered almost all countries involving more than 16 million people, and more than 600 000 of whom have died. Although the lungs are most often damaged, proteinuria is observed in 44% and hematuria in 27% of cases, and acute kidney injury (AKI) develops in 5%. Moreover, among patients requiring mechanical ventilation, 52% develop AKI within 24 hours after intubation and switched to renal replacement therapy (RRT).

In this coronavirus infection, many toxic substances are accumulated in the blood, leading to the “cytokine storm”. The main injuries occur in the vascular endothelium, leading to the vessels porosity and there is an exit of not only of the fluid, but also of endotoxins into the interstitial space. In this case, toxic damage occurs in the kidneys of both the glomerular apparatus and the tubular epithelium with significant disorders of their functions requiring RRT, and despite this, mortality rate reaches 30-70%. The predisposing factors are diabetes and arterial hypertension, as well as previous chronic liver and kidney diseases, which is accompanied by higher mortality rate.

There is still no specific antiviral therapy. The drugs used often have a number of side effects, including hepato- and nephrotoxicity, which makes them dangerous, given that the kidneys are also the target organ for COVID-19 infection. Considering the accumulation of cytokines, in particular of IL-6, its specific inhibitors, such as tocilizumab, are used; however, this is also associated with a number of side effects in many patients. Therefore, most of them need RRT in terminal renal failure.

The most common treatment tactics for AKI is RRT using mainly various hemofiltration methods. However, not all toxic products are removed, and the mortality rate remains quite high. Therefore, the use of plasma exchange with replacement of the removed plasma with freshly frozen donor plasma is the most pathogenetically justified. In plasma exchange, there is a more effective decrease in the levels of C-reactive protein and IL-6 than using tocilizumab. In our earlier studies, plasma exchange in AKI caused by other conditions (sepsis etc.) enabled us to reduce mortality from 73.33% to 31.03%.

Biography:

Valerii A. Voinov – MD, PhD, professor, head of Therapeutic apheresis department, of I.P. Pavlov’s St. Petersburg State Medical University. He is the author of more than 470 scientific pa-



pers, including 12 monographs, 25 inventions and patents on the problems of therapeutic apheresis in various fields of medicine. Valerii A. Voinov participated in creating the first domestic plasma filters PFM-800 as well as PFM-TT “ROSA” and development of devices and methods of membrane plasmapheresis and their deployment in medical institutions of Russia and abroad in many countries of Europe, Asia, Africa and Latin America. His main book, “Therapeutic Apheresis”, has been translated into Bulgarian, Romanian, English, and Spanish.

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