



# Dijalizno lečenje akutnog oštećenja bubrega u sklopu kovid-19 infekcije

## Dialysis of Acute Kidney Damage Due to COVID-19 Infection

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### Apstrakt

Pandemija bolesti uzrokovane novim koronavirusom zbog visoke virulentnosti agensa, velike brzine širenja infekcije i broja slučajeva sa teškom kliničkom slikom, suočila je zdravstvene sisteme širom sveta sa najvećim izazovom u istoriji moderne medicine. Akutno oštećenje bubrega (AOB) je bilo česta komplikacija među obolelima od kovid-19 infekcije, sa procenjenom incidencom od oko 30%, dok je preko 70% bolesnika sa ovom komplikacijom zahtevalo intenzivnu negu i lečenje. Mehanizmi oštećenja bubrega kod ovih bolesnika su kompleksni i uključuju direktno dejstvo virusa na tkivo bubrega, indirektno posledice multiorganskih oštećenja, hipovolemije, inflamacije, superinfekcije, rhabdomiolize i tromboze, kao i posledice primenjenog lečenja (mehanička ventilacija, nefrotoksičnost lekova i hipervolemija).

Preporučene inicijalne terapijske mere u lečenju AOB u sklopu kovid-19 infekcije se ne razlikuju od uobičajenih mera koje se primenjuju u lečenju AOB druge etiologije, naročito u sepsi i višeorganskom popuštanju. Savetuju se održavanje adekvatnog volemijskog statusa, izbegavanje primene nefrotoksičnih agenasa i korekcija doza lekova. Velikom broju bolesnika je pored konzervativnih mera, neophodno i dijalizno lečenje. Načelna je preporuka da se zbog česte hemodinamske nestabilnosti ovih pacijenata i mogućnosti efikasnijeg uklanjanja medijatora inflamacije, kao dijalizni modalitet izbora primenjuju kontinuirani postupci hemodijalize ili prolongirana intermitentna hemodijaliza. Ovi izbori u praksi nose brojne izazove, počevši od dostupnosti modaliteta, tehničke opremljenosti i kapaciteta centra, preko pitanja adekvatnog načina prevencije intradijalizne koagulacije i doziranja lekova tokom postupka, do problema ljudskih resursa. Kao alternativnu opciju, pojedini autori su predložili primenu akutne peritoneumske dijalize, uz praktične preporuke za izvođenje procedure. Intermitentna hemodijaliza je poslednja opcija, naročito nepovoljna za hemodinamski nestabilne bolesnike. Uprkos svim primenjenim merama, pojava AOB u sklopu kovid-19 infekcije bila je povezana sa lošom prognozom i visokom stopom smrtnosti, višom nego kod bolesnika sa AOB bez kovid-19 infekcije, a najvišom kada je bilo neophodno primeniti i dijalizno lečenje.

### Abstract

The pandemic of the disease caused by the new coronavirus due to the high virulence of the agent, the high speed of the spread of infection, and the number of cases with a severe clinical picture have faced the health systems around the world with the greatest challenge in the history of modern medicine. Acute kidney injury was a frequent complication among patients with COVID-19, with an estimated incidence of about 30%, while over 70% of patients with this complication required intensive care and treatment. The mechanisms of kidney damage in these patients are complex and include the direct effect of the virus on the kidney tissue, indirect consequences of multiorgan damage, hypovolemia, inflammation, superinfection, rhabdomyolysis, and thrombosis, as well as the consequences of the applied treatment (mechanical ventilation, drug nephrotoxicity, and hypervolemia).

The recommended initial therapeutic measures in the treatment of acute kidney injury in the context of COVID-19 do not differ from the usual measures applied in the treatment of acute kidney injury of other etiologies, especially in sepsis and multi-organ failure. It is recommended to maintain an adequate volemic status, avoid the use of nephrotoxic agents, and adjust the dosage of drugs. In addition to conservative measures, dialysis treatment is also necessary for a large number of patients. The basic recommendation is that due to the frequent hemodynamic instability of these patients and the possibility of more effective removal of inflammatory mediators, continuous hemodialysis procedures or prolonged intermittent hemodialysis should be used as the dialysis modality of choice. These choices in practice bring numerous challenges, starting from the availability of modalities, technical equipment, and capacity of the center, over the question of an adequate way of preventing intra dialysis coagulation and dosing of drugs during the procedure, to the problem of human resources. As an alternative option, some authors have proposed the application of acute peritoneal dialysis with practical recommendations for performing the procedure. Intermittent hemodialysis is the last option, especially unfavorable for hemodynamically unstable patients. Despite all the measures applied, the occurrence of acute kidney injury in the context of COVID-19 was associated with a poor prognosis and a high mortality rate, higher than in patients with acute kidney injury without COVID-19, and the highest when it was necessary to apply dialysis treatment.

