Something new, something good. MCU - Medium Cut-off filter for COVID-19 AKI. First use in Ecuador

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Abstract

This article evidences the effectiveness of the use of MCO filters in the removal of IL-6 in a patient with acute renal failure caused in a critically ill patient with COVID-19 who need renal replacement therapy in continuos venvenous hemodialysis modality. COVID-19-associated AKI (COVID-19 AKI) is associated with high mortality and serves as an independent risk factor for all-cause in-hospital death in patients with COVID-19 1,2.

MCO membranes allows to remove middle molecules (50,000 Da), such as IL-6, IL-1, FNT-a, FLC k (aorund 25000 Da)3, proteins associated with the inflammatory responsethis. MCO has the ability may reduce inflammation, as supported by the lowering of the concentration of inflammatory cytokines and the reduction of transcription of pro-inflammatory cytokines in peripheral leukocytes4.

Case Presentation

Male, 66 years, without comorbidities, admitted to ICU for respiratory failure, who developed severe acute respiratory distress syndrome ARDS, with double vasoactive support and mechanical ventilation requiring pronation sessions. SARS-COV-2 diagnosis confirmed by real-time PCR. Who develop acuate kidney injury (AKI) by decrease in urinary output and progressive increase in creatianine and urea. Although the patient had hemodynamic compromise, a component of cytokine release syndrome was evidenced, so an MCO filter was chosen due to its ability to eliminate IL6, over the use of a high-flow filter to improve hemodynamic condition. Continuous renal replacement therapy was carried out in CVVHD mode with EMiC2® filter in a Multifiltrate® machine for a period of 72 hours.

MCO filter decrease in IL6 was evidenced, with a marked improvement in hemodynamic parameters, achieving the removal of vasoactive amines in 48 hours and 72 hours after starting CRRT.

Image

ARDS	Severe- Mechanical ventilation requiring pronation sessions.			
CRRT-CVVH with EMiC2	Star point	24 hours	48 hours	72 hours
AKI	No	Yes	Yes	Yes
Urinary output ml/kg/hr	1.1	0. .1	0.1	0.06
Creatinine (mg/dl)	0.72	1. 0.67	1.58	2.67
Biomarkers Reference range				
Il-6 (pg/ml) 0.0-7.0	>5000	77	21	94
Ferritin (ng/ml) 30-400	1626	>2000	839	1669
D-Dimer (ng/ml) 0-500	3352	2422	3207	5010
Amines	Yes, 2	Yes, 2	Yes, 1	No

Figure 1. clinical, interventional and biochemical parameters during the period of CRRT

Discussion

Currently, there is no therapy for the treatment of COVID 19 per se, although the studies show improvement in parameters, the different multi-organ support treatments have improved the survival of patients. Although this therapeutic option (use of MCO filters) presented relevant findings in the removal of IL6 in patients with acute renal failure, it is necessary to carry out controlled clinical studies to determine the validity of the information presented here. But in the case of patients with acute renal failure with elevated systemic inflammatory markers, the use of the MCO filter in acute renal replacement therapy should be considered as a valid therapeutic option in the management of critically ill patients.

References

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Biography: (100 -200 words)

Harold Alvarez is a neurologist, also has master's degrees in business administration, health management, and is currently pursuing a master's degree in epidemiology and collective health. He developed his professional practice as a nephrologist at the General Hospital of the South of Quito, a hospital designated as a sentinel for the management of patients with COVID-19. Together with the team of nephrologists and intensive care physicians, have been able to use continuous renal replacement therapy and hemodadsorption therapy in critically ill patients due to SARS-COV-2 disease..

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