

Efficacy of hemadsorption combined with CRRT in the treatment of irreversible septic shock. Review of the case studies of the last two years in the Intensive Care of Trieste

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Introduction

Septic shock is a complex evolution of sepsis characterized by vasoplegia, multi-organ hypoperfusion, and acute renal failure (S-AKI) secondary to cytokine storm, often resistant to support with vasopressor drugs. A rapid and sustained reduction of cytokine burden and thus attenuation of excess immune response by the use of inflammatory mediators adsorption with Cytosorb® is often reported as an adjunctive therapy aimed at circulatory stabilization and thereby increasing the chance of recovery. In this study, we evaluated the impact of CRRT + Cytosorb® treatment in the patient hospitalized for S-AKI in the ICU on hemodynamic stability, inflammation and survival.

Methods

This is a retrospective study on adult patients with S-AKI treated with CRRT in ICU between January 2020 and April 2022. For each patient, data on blood pressure values (PAS, PAD, PAM), phlogosis indices (PCR, PCT), vasopressor therapy with noradrenaline (gamma / kg / min) and vital status at discharge were collected. The treatment time was used as a measure of the intensity of the treatment. The variation in clinical-laboratory parameters between the start and end of the observation (Δ = final value - initial value) was used to define the clinical, hemodynamic and infectious impact of the method. Non-parametric statistical tests were used to compare the clinical and blood chemistry variables of interest between the groups.

Results

Overall, 59 patients with S-AKI (36 m, 23 f), age 64 (IQR 54-76) were selected; 26 were discharged from TI (S), 33 died (NS) (Table 1). Patients S and those with greater treatment intensity (duration ≥ 72 h) had better control of hemodynamics and the trend of inflammation indices (Table 1).

Conclusions

Our data confirm the efficacy of CRRT + Cytosorb® therapy in the management of patients with S-AKI, optimizing hemodynamic and inflammatory control and improving the outcome in TI.

Tabella 1. Confronto tra sopravvissuti e non sopravvissuti per le variabili cliniche ed ematochimiche di interesse

	Totale No 59	Sopravvissuti No 26	Non Sopravvissuti No 33	P*
PAS pre, mmHg, mediana [IQR]	100.0 [90.0, 110.0]	100.0 [90.0, 105.0]	100.0 [90.0, 110.0]	0.763
PAS post, mmHg, mediana [IQR]	105.0 [80.0, 120.0]	120.0 [111.3, 130.0]	90.0 [80.0, 110.0]	<0.001
Δ PAS, mmHg, mediana [IQR]	5.0 [-20.0, 30.0]	25.0 [10.0, 33.8]	-15.0 [-30.0, 5.0]	<0.001
PAD pre, mmHg, mediana [IQR]	50.0 [40.0, 60.0]	50.0 [40.0, 57.5]	50.0 [40.0, 60.0]	0.447
PAD post, mmHg, mediana [IQR]	50.0 [40.0, 57.5]	60.0 [50.0, 70.0]	40.0 [30.0, 50.0]	<0.001
Δ PAD, mmHg, mediana [IQR]	0.0 [-17.5, 10.0]	10.0 [0.0, 13.8]	-10.0 [-20.0, 0.0]	<0.001
PAM pre, mmHg, mediana [IQR]	66.7 [59.2, 73.3]	64.2 [58.8, 71.3]	66.7 [60.0, 75.0]	0.453
PAM post, mmHg, mediana [IQR]	66.7 [55.0, 80.0]	80.0 [68.8, 92.5]	60.0 [46.7, 65.0]	<0.001
Δ PAM, mmHg, mediana [IQR]	3.3 [-16.7, 16.5]	15.0 [8.8, 24.6]	-10.0 [-25.0, 3.3]	<0.001
PCT pre, ng/mL, mediana [IQR]	9.3 [2.2, 69.1]	24.0 [2.7, 77.7]	8.8 [2.2, 47.6]	0.567
PCT post, ng/mL, mediana [IQR]	3.2 [2.2, 10.5]	3.0 [0.4, 9.3]	3.2 [2.4, 14.4]	0.187
Δ PCT, ng/mL, mediana [IQR]	-7.0 [-41.4, -0.7]	-22.0 [-63.4, -1.4]	-4.0 [-27.9, 0.3]	0.148
PCR pre, mg/L, mediana [IQR]	236.9 [131.8, 285.9]	246.0 [174.2, 285.2]	204.0 [94.6, 285.9]	0.352
PCR post, mg/L, mediana [IQR]	88.7 [40.4, 131.8]	70.0 [32.0, 104.2]	107.3 [47.8, 196.3]	0.039
Δ PCR, mg/L, mediana [IQR]	-108.5 [-190.3, -16.1]	-170.2 [-223.6, -94.5]	-32.5 [-114.9, 6.7]	<0.001
Lat pre, mmol/L, mediana [IQR]	20.1 [12.6, 41.3]	20.9 [14.9, 42.5]	18.8 [9.5, 40.7]	0.455
Lat post, mmol/L, mediana [IQR]	12.3 [6.2, 26.7]	7.9 [4.8, 12.3]	20.0 [11.2, 93.0]	0.001
Δ Lat, mmol/L, mediana [IQR]	-3.8 [-14.1, 7.1]	-11.7 [-28.7, -7.5]	4.3 [-2.2, 31.3]	<0.001
Nora pre, gamma/Kg/min, mediana [IQR]	0.6 [0.4, 0.9]	0.5 [0.4, 0.8]	0.6 [0.4, 1.0]	0.277
Nora post, gamma/Kg/min, mediana [IQR]	0.5 [0.1, 1.0]	0.0 [0.0, 0.1]	0.9 [0.5, 1.2]	<0.001
Δ Nora, gamma/Kg/min, mediana [IQR]	-0.1 [-0.6, 0.3]	-0.5 [-0.7, -0.1]	0.1 [-0.1, 0.7]	<0.001
Durata CRRT-Cyt, ore, mediana [IQR]	72.0 [24.0, 132.0]	72.0 [72.0, 162.0]	48.0 [24.0, 96.0]	0.048

PAS, pressione arteriosa sistolica; PAD, pressione arteriosa diastolica; PAM, pressione arteriosa media; PCT, procalcitonina; PCR, proteina C-reattiva; Lat, lattati; Nora, noradrenalina; Δ , valore post - valore pre; Cyt, Cytosorb; * test Mann-Whitney