

Use of CytoSorb and CKRT in burn patients with septic shock and Acute Kidney Injury

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Introduction

The use of continuous kidney replacement therapy (CKRT) is critical in burn patients suffering from Acute Kidney Injury (AKI), particularly for managing fluid overload and electrolyte imbalances. However, CKRT doesn't directly address the underlying inflammatory response that exacerbates the patient's condition in AKI-associated septic shock. Sorbent therapies, such as cytokine adsorbers, are an emerging approach that could potentially help manage these metabolic and inflammatory derangements.

Methods

Out of 461 admitted burn patients between January 2017 and December 2022, 35 developed AKI-associated septic shock receiving CKRT for more than 72 h. Among them, 11 patients were treated with CytoSorb as adjunctive therapy for refractory septic shock and 24 patients were not. CKRT was started when patients were in a trend of fluid overload and not responsive to conservative management. CytoSorb and CKRT were coupled in all patients of the Sorbent group. CytoSorb was changed after 24 h, as well as the extracorporeal circuit.

Results

No significant difference was found between the 2 groups for age, burn size, SOFA score, lactate, norepinephrine, and expected mortality by the Baux index (54.0 and 55.1%, respectively). Patients in the Sorbent group required significantly less norepinephrine compared to those in the Control group, indicating a potential improvement in hemodynamic stability (Fig. 1). This effect was observed over the first four days of treatment. In-hospital mortality rate was 45.4% for the Sorbent group and 70.8% for the Control group, showing a notable improvement in survival among those who received CytoSorb. Kaplan-Meier Survival Analysis at 270 days demonstrated a significant improvement in survival for the Sorbent group ($p = 0.0445$). In both groups, all surviving patients had recovered renal function by discharge, while no non-survivors did.

Conclusion

This finding supports that CytoSorb could be a valuable adjunct in the treatment of septic shock and AKI in burn patients. The combination of CKRT and CytoSorb might enhance clinical outcomes and reduce mortality.

Figure 1: – Outcome of norepinephrine requirement in the first 4 days for Sorbent (n 11 patients) and Control groups (n 24 patients). A significant difference was found between the norepinephrine requirement of days 1–4 and between day 1 and day 4 for patients of the Sorbent group. Data were given as median with quartiles (25th and 75th percentiles). $p > 0.05$ with Kruskal-Wallis ANOVA and multi-comparison test.

