

CytoSorb® Hemoadsorption in a Complex Case of Rhabdomyolysis and Hemorrhagic Shock: Role in Kidney Function Restoration

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Introduction

Rhabdomyolysis is a significant cause of acute kidney injury (AKI) in critically ill patients, often resulting from trauma, sepsis, surgery, or prolonged ischemia. The release of myoglobin into circulation contributes to renal damage through tubular toxicity and vasoconstriction. Standard continuous renal replacement therapy (CRRT) is limited in myoglobin clearance due to its size and hydrophobic properties. CytoSorb® hemoperfusion has emerged as a promising adjunct for early myoglobin removal to prevent or mitigate AKI.

Methods

A 17-year-old female was admitted in critical condition following a high-impact road accident. She presented with hemorrhagic shock (BP 95/55 mmHg, HR 116 bpm), metabolic alkalosis, elevated lactate (4.4 mmol/L), and severe hyperkalemia (6.75 mmol/L). Imaging revealed multiple fractures, including a severe pelvic injury and soft tissue trauma in the perineal region. After surgical stabilization and ICU admission, she received mechanical ventilation, vasopressors, and fluid resuscitation.

Results

Within 24 hours, the patient developed oliguria (<30 mL/h) and myoglobin levels exceeded 10,000 ng/mL. Serum creatinine doubled, meeting criteria for KDIGO stage III AKI. CRRT combined with CytoSorb® hemoperfusion was initiated, with cartridges replaced every 24 hours for four days. A significant reduction in myoglobin occurred within 48 hours, and renal function gradually improved. Renal replacement therapy was discontinued by day 12, with full renal recovery by day 30. No further dialysis was needed.

Conclusion

This case underscores the potential benefit of CytoSorb® hemoperfusion in managing rhabdomyolysis-associated AKI. Initiating treatment early, particularly in patients with myoglobin >10,000 ng/mL, may enhance renal recovery. While supportive care remains essential, adjunctive hemoadsorption may offer a valuable strategy in complex trauma-induced AKI. Prospective studies are warranted to refine treatment timing and patient selection.



Figure 1. Trend of serum myoglobin and CPK levels and renal function during CytoSorb treatment