

Treatment of rhabdomyolysis-induced AKI with blood purification

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Introduction

An increasing number of studies suggest the effectiveness of hemoadsorption (HA) in managing severe rhabdomyolysis. CK and myoglobin seem to be correlated, but the most studies identify myoglobin as a better biomarker and some authors suggest a limited removal of CK even with HA.

Methods

A 3-year-old girl weighing 13kg admitted to the PICU for altered sensorium, hyponatremia, metabolic acidosis, and hyperkalemia diagnosed as severe viral rhabdomyolysis. CK values increase from 33,742 to 290,980U/L within 24h. Real-time myoglobin measurement was unavailable. Continuous Kidney Replacement Therapy (CKRT) treatment was initiated using a high-flux (ANST69) continuous veno-venous hemodiafiltration (CVVHDF) mode.

Results

We observed a further increase in CK values over the next 4h, reaching a maximum of 349,600U/L. Subsequently HA with a Cytosorb in combination with CKRT was initiated with a reduction of CK to 117,200U/L in the next 6h. The sorbent was then replaced after 12h following a CK plateau at 118,640U/L. After 12h, we further changed the column and CK values reduced to 63,860U/L. Thus, we decided to continue treatment exclusively with CKRT, observing a progressive reduction in CK values to < 10.000 U/L (figure 1). The patient was discharged from the PICU on the 10th day with no dependence on dialysis

Conclusion

We advocate for a "paradigm shift" in managing severe rhabdomyolysis, recommending HA for CK levels >12,000U/L and >10,000ng/ml myoglobin.

Figure 1: Upper section of the figure shows time course of Creatinine Kinase (CK) during the extra-corporeal therapy with Continuous Kidney Replacement Therapy (CKRT) and Cytosorb hemoadsorption. The white window depicts the time course of CK measured at the inlet and the outlet of the cartridge between Time 0 (0h) and after 6h (6 h). At the different time points is reported the CK removal ratio of the cartridge (calculated as [Concentration at baseline (CB0)-Concentration at the end of the treatment (Cend)/CB0*100]). Bottom section of the figure shows the histograms at different time points for creatinine blood level (yellow bars), urine output measured in ml in 24h (orange bars), urine output measured as ml/kg/h (blue bars), ultrafiltration rate of CKRT (ml/h)

