

Hemoperfusion with Cytosorb in acute pediatric carbamazepine intoxication: a case report

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Introduction

Carbamazepine (CBZ) intoxication is a potentially life-threatening condition due to its narrow therapeutic index and slow metabolism. In severe cases with central nervous system depression, extracorporeal removal may be considered. We report the case of a 7-year-old girl treated with Cytosorb[®] hemoperfusion following acute CBZ overdose.

Methods

A 7-year-old female patient, with a body weight 22 kg, and a known history of focal epilepsy (on chronic CBZ therapy), autism spectrum disorder, and intellectual disability presented with coma (GCS 3/15) after suspected ingestion of 4000 mg of CBZ (57 mg/kg). Initial serum CBZ level was 144 $\mu\text{mol/L}$. Following intubation and gastric decontamination (activated charcoal, intralipid, and EGDS), a short term hemodialysis central venous catheter was placed and a Cytosorb hemoperfusion cycle was initiated, along with low-dose norepinephrine and continuous heparin infusion titrated to ACT values. The patient was sedated and invasively ventilated during the procedure.

Results

Hemoperfusion was performed over a 8 hours period (Qb 150ml/min) and was well tolerated, with stable hemodynamics and no adverse events. A rapid decline in CBZ levels was observed (144 $\rightarrow$ 139 $\rightarrow$ 39 $\rightarrow$ 29 $\rightarrow$ 10 $\mu\text{mol/L}$ over 48 hours) (figure 1). The patient regained consciousness progressively and was successfully extubated on day 3. EEG and cardiac evaluations were normal. She was transferred to the Neurology Unit in stable condition, with full neurological recovery (GCS 15/15) and resumption of enteral feeding. CBZ was gradually reintroduced at a lower dose before discharge.

Conclusions

This case highlights the potential role of Cytosorb hemoperfusion in managing severe CBZ intoxication in pediatric patients. Despite CBZ's high protein binding, early extracorporeal removal in combination with standard detoxification measures was associated with rapid clinical improvement and normalization of serum levels. Further studies are needed to confirm the efficacy and safety of Cytosorb in pediatric toxicology.

