

Use of the CytoSorb® in drug and toxins poisoning: a Narrative Review

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Introduction

Acute poisoning due to drugs or exogenous toxins is a potentially life-threatening clinical condition, often characterized by metabolic shock, multiorgan failure, and lactic acidosis. In the most severe cases, extracorporeal detoxification may be essential to ensure patient survival and prevent irreversible organ damage.

CytoSorb®, thanks to its high surface and biocompatible polymer beads, enables the removal of hydrophobic molecules with a molecular weight of up to 55 kDa, including cytokines, bilirubin, myoglobin, ticagrelor, rivaroxaban, drugs and toxic pharmacological substances. Its use in the field of toxicology is emerging as an effective adjunct to conventional intensive care therapies, particularly in patients with limited therapeutic alternatives.

Methods

We reviewed five clinical cases treated between 2019 and 2024 for acute poisoning: three cases of metformin overdose, one of quetiapine overdose, and one case of toxic mushroom ingestion (*Clitocybe dealbata*). All patients presented with acute kidney injury (AKI), severe metabolic acidosis (pH < 7.0, lactate > 9 mmol/L), shock requiring vasopressor support, and a poor prognosis (APACHE IV scores ranging from 48 to 100). Continuous veno-venous hemodialysis (CVVHD) combined with CytoSorb therapy was initiated in all cases, for durations ranging from 24 to 72 hours. Treatment was supplemented with supportive therapy including antibiotics, vasopressors, bicarbonate infusions, and, in selected cases, intravenous immunoglobulins or activated charcoal.

Results

All patients demonstrated resolution of lactic acidosis, recovery of spontaneous diuresis, and hemodynamic stabilization with withdrawal of vasopressor support. In the metformin cases, CytoSorb contributed to rapid detoxification despite the presence of septic shock and severe renal dysfunction. The quetiapine case resulted in progressive neurological and cardiac recovery. In the case of mushroom poisoning, hemoadsorption facilitated renal function recovery and metabolic rebalancing.

Conclusion

CytoSorb therapy represents an effective and safe adjunctive option in the management of complex acute poisonings, particularly in the setting of shock and multiorgan failure. Its ability to remove toxins, drugs and cytokines may significantly improve clinical outcomes in critically ill patients. These documented clinical experiences support the early integration of CytoSorb into intensive care management strategies for severe intoxications.