

# Efficacy of Cytosorb Use in the Treatment of Multiple Organ Dysfunction Syndrome Secondary to Salmonella Typhi Sepsis in a 9-Month-Old Paediatric Patient in Intensive Care

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## Introduction

Multiple Organ Dysfunction Syndrome (MODS) is a critical condition characterized by decreased functionality of multiple organs secondary to acute infection, which lead to systemic inflammatory response syndrome, sepsis, and septic shock. CytoSorb is a sorbent cartridge made of a polystyrene-divinylbenzene copolymer, certified for modulating the blood concentration of cytokines, which can be a supportive treatment in this sepsis's complication.

## Methods

In the case we describe the application of hemadsorption to control MODS induced by Salmonella Typhi Sepsis.

## Results

A 9-month-old girl was admitted to the emergency department with hyperpyrexia (Tmax 38.2°C), diarrhea, severe hypotension, oliguria, sinus tachycardia (230 bpm), and SpO<sub>2</sub> of 96%. Laboratory tests revealed acute renal failure, liver dysfunction, leukocytosis, and elevated inflammatory markers (CRP 233 mg/L, procalcitonin > 1000 ng/mL). Due to clinical deterioration, including absence of responses to stimuli, patient required intraosseous hydration, orotracheal intubation, and transfer to Pediatric Intensive Care for MODS management. Broad-spectrum antibiotics (Meropenem, Linezolid, Vancomycin) were initiated alongside adrenaline and noradrenaline for severe hypotension. Further investigations revealed Salmonella Typhi septicemia, along with Epstein-Barr virus and Haemophilus Influenzae infections. After failing to respond to antibiotics after four days, CytoSorb therapy combined with Continuous Venovenous Haemodiafiltration (CVVHDF) was started to manage the cytokines storm. Three consecutive sessions (two lasting 12 hours and one lasting 24 hours) led to significant improvement in blood parameters, diuresis, and reduced inflammation (figure 1). Vasopressors and antibiotics were discontinued within 48 hours of CytoSorb initiation. Despite cardiovascular recovery, brain MRI later revealed ischemic cortical damage. After 19 days, she was transferred to Infectious Diseases and Neurology wards with a diagnosis of "tetraparesis secondary to septic shock." She was referred for neurological and nephrological follow-up and rehabilitative therapy.

## Conclusion

This case highlights the critical role of advanced intervention with CytoSorb and CVVHDF during the complex MODS management.

