



# HEMOADSORPTION WITH CYTOSORB, SINGLE-CENTER PRELIMINARY EXPERIENCE

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**BACKGROUND:** Sepsis is the most common cause of death in intensive care units (ICU). If sepsis progresses to refractory septic shock, mortality may reach 90–100% despite optimum current therapy. One of the hallmarks of sepsis is the excessive release of cytokines and other inflammatory mediators causing refractory hypotension, tissue damage, metabolic acidosis and ultimately multiple organ failure. Cytokine reduction by hemoadsorption represents a new concept for blood purification, developed to attenuate the systemic levels of pro-inflammatory and anti-inflammatory mediators released in the early phase of sepsis.

**METHODS:** We evaluated the impact of a new hemoadsorption device (CytoSorb) used as adjunctive therapy, on hemodynamics and clinically relevant outcome parameters in 20 critically ill patients with septic shock and in need of renal replacement therapy in Intensive Care Unit. Mean levels of MAP, procalcitonin, noradrenalin need and SOFA score were evaluated. Renal replacement therapy (RRT) of acute renal failure was performed either as continuous venovenous hemofiltration (CVVH) or continuous venovenous haemodialysis (CVVHD) at the discretion of the attending physician. Flow rates were set to achieve a dialysis dose of 25 ml/kg/h, blood flow rate was set accordingly. Hemoperfusion was started after refractory shock was diagnosed. The adsorber [total volume 300 ml, priming volume 120 ml, filled with sterile normal saline (NaCl 0.9%)] was connected in a PRAE-filter position into the RRT circuit. The first exchange was performed within 24 h without interruption. Further adsorber exchanges were at the discretion of the study physicians.

**RESULTS:** After Cytosorb treatment procalcitonin, C-reactive protein and white cells count all decreased vs basal levels. This feature was associated with hemodynamic stabilization and a reduction of noradrenaline infusion. SOFA score improved in 7/20 patients, however overall mortality was 75%. Treatment using the CytoSorb device was safe and well-tolerated with no device-related adverse events during or after the treatment sessions.

	Baseline	After hemoadsorbtion
procalcitonin	31	7
C-reactive protein	67	13
leukocytes	18.250	12.300
Vasopressor dose mcg/kg/m	4.2	2.3

**CONCLUSIONS:** In severe septic shock unresponsive to standard treatment, haemodynamic stabilization and inflammatory parameters improved using cytokine adsorption therapy. These effects seem to be more pronounced when therapy started within 24 h of sepsis diagnosis, whereas a delay was associated with a poor response to therapy in terms of reduction of catecholamine demand and survival. Detailed studies may better define the potential benefits of this new treatment option.