

## Use of CytoSorb in an elderly patient with septic shock in the early post-neurosurgery period

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*This case reports on a 82-year-old female patient who was transferred to the neurosurgical intensive care unit (ICU) following an elective surgical procedure on a right frontal lobe glial tumor with intraoperative development of septic shock.*

### Case presentation

- Urinary tract infection was suspected as the most probable source of infection and the patient was started on broad-spectrum antibiotic therapy while still in the operating theatre
- Upon transfer to the ICU, the patient's condition was critical with hypotension (mean arterial pressure 58 mmHg), high vasopressor requirements (norepinephrine 0.77 µg/kg/min), lactic acidosis (4.4 mmol/l) and a SOFA score of 12
- Laboratory analysis revealed clearly elevated plasma concentrations of inflammatory mediators (PCT >200 ng/ml, CRP 182 mg/dl, IL-6 3979 pg/ml, IL-10 585 pg/ml) indicating a pronounced hyperinflammatory state
- Hemodynamic derangement could not be sufficiently stabilized for the next 14 hours despite maximum therapeutic measures while multiple organ failure including renal failure developed
- In order to attenuate the inflammatory situation, to stabilize hemodynamics and to prevent further progression of multiple organ failure, a combination of continuous renal replacement therapy (CRRT) and CytoSorb hemoadsorption was started

### Therapy

- One therapy session with CytoSorb for a total treatment time of 24 hours
- CytoSorb was used in conjunction with CRRT (Prismaflex, Gambro Medical, Sweden) run in continuous veno-venous hemodiafiltration (CVVHDF) mode
- Blood flow rate: 130 ml/min
- Anticoagulation: citrate
- CytoSorb adsorber position: post-hemofilter

### Measurements

- Vasopressor requirements
- Inflammatory markers
- SOFA score
- Level of consciousness

## Results

- Already within 12 hours of combined therapy, vasopressor requirements could be significantly decreased from 0.77 to 0.39 µg/kg/min. Vasopressor support was no longer required 36 hours after CytoSorb therapy initiation
- Inflammatory markers could be clearly reduced within 24 hours of CRRT+CytoSorb therapy - PCT levels dropped from >200 to 86.62 ng/ml, IL-6 from 3797 to 85.22 pg/ml and IL-10 from 581 to 21.1 pg/ml while CRP levels did not change
- Treatment was further associated with a reduction of SOFA score from 12 to 8 points within the first 24 hours and another drop to 6 at 48 hours
- Her level of consciousness improved significantly during the course of just one treatment

## Patient Follow-Up

- The patient was extubated 72 hours after cessation of CytoSorb therapy
- A cerebral CT scan confirmed absence of hemorrhagic complications
- The patient could be discharged to the rehabilitation center on day 14 after neurosurgery in a hemodynamically stable condition without the need for further dialysis therapy

## Conclusions

- In this patient with septic shock in the early post-neurosurgery period the combined treatment with standard therapy, CRRT and CytoSorb hemoadsorption was associated with rapid hemodynamic stabilization, a control of the inflammatory situation and attenuation of further organ dysfunction progression
- According to the medical team, combined extracorporeal measures including CytoSorb effectively helped to stabilize the quickly deteriorating clinical status of this elderly patient and may have considerably contributed to the quick recovery with barely no apparent side effects in the follow-up period
- Application of CytoSorb in combination with citrate-anticoagulated CRRT was safe and simple