

Use of CytoSorb in acute renal failure in the context of urosepsis with concomitant rhabdomyolysis

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This case study reports on a 66-year-old male patient, who was picked up by the police in his truck while on the highway due to conspicuous driving behavior, and was brought directly to the hospital with suspected alcohol intoxication.

Case presentation

- On admission, the patient was normothermic (37 ° C), but showed marked hemodynamic instability (HF 108/min, blood pressure 75/44 mmHg, respiratory rate 25/min) and was therefore immediately transferred to the intensive care unit
- Instantaneous laboratory diagnostics revealed strongly increased inflammatory parameters (CRP 14.4 mg/dl, PCT > 100 ng/ml, IL-6 513 pg/ml, leukocytes 19.5/nl) as well as progressive acute renal failure (creatinine 4.17 mg/dl, GFR 0 ml/min)
- In addition, he was clinically anuric for the first 5 hours despite adequate volume- (3 liters within the first 4 hours) and catecholamine therapy (norepinephrine 0.03 µg/kg/min)
- A significant increase in LDH (1850 U/l), CK (> 20000 U/l) and myoglobin (> 4920 µg/l) indicated pronounced and ongoing rhabdomyolysis
- Antibiotic therapy was immediately initiated using piperacillin/tazobactam within the first hour after admission
- The clinical examination also showed that his left lower limb was severely reddened, swollen and hot - the suspicion of erysipelas was later confirmed by the detection of streptococci group G and Staph aureus (MSSA) and antibiotic therapy was extended to clindamycin
- Furthermore, there was proof of a nitrite-positive urinary tract infection (without pathogen detection) within the first 2 hours after admission
- Due to his severe septic condition combined with acute anuric renal failure and rhabdomyolysis, continuous renal replacement therapy was started together with CytoSorb hemoadsorption within 5 hours of admission

Treatment

- In total, three consecutive treatments with CytoSorb for a total treatment time of 72 hours (24 hours for each treatment) were performed
- CytoSorb was used in conjunction with CRRT (Prismaflex, Gambro) performed in CVHDF mode
- Blood flow rate: 130 ml/min
- Anticoagulation: citrate
- CytoSorb adsorber position: post-hemofilter

Measurements

- Demand for catecholamines
- Inflammatory parameters (CRP, PCT, IL-6, leukocytes)
- Renal function (excretion)
- Markers for rhabdomyolysis (CK, myoglobin)

Results

- Hemodynamic stabilization with significant reduction in catecholamine dosages – within the first 24 hours, norepinephrine initially tended to increase to 0.065 µg/kg/min, however doses could be successively reduced after 36 hours and were stopped with termination of the last CytoSorb treatment
- Reduction of inflammatory and infection markers within the first 24 hours - PCT 75.6 ng/ml, leukocytes 15.8/nl, after 72 hours a further reduction was observed (PCT 23.06 ng/ml, IL-6 448 ng/ml, leukocytes 15.4/nl), with a tendency to further decline thereafter
- Renal function remained relatively unchanged after 24 hours (anuric), and also after 48 and 72 hours the patient remained anuric
- Markers of rhabdomyolysis: Myoglobin remained above the measurement range for the entire treatment period; after 3 additional days, a decrease to 2400 µg/l was noticed, CK remained >20,000 U/l after 24 and 48 hours of treatment and dropped to 11,415 U/l after 72 hours

Patient Follow-Up

- Termination of renal replacement therapy 4 days after the last CytoSorb treatment followed by renal replacement therapy using intermittent hemodialysis for 3 more days, thereafter continuous improvement in spontaneous diuresis and excretion could be achieved by intravenous diuretic therapy, further improving thereafter
- After 11 days, a complete reduction of inflammation and infection markers back to normal values was noticed as well as normalization of myoglobin levels (after 2 weeks)
- 26 days after the last CytoSorb treatment, the patient was mobile and was successfully transferred into a rehabilitation unit

CONCLUSIONS

- **Treatment with CytoSorb was accompanied by stabilization in hemodynamics and declining catecholamine dosages within 72 hours**
- **By the early use of CytoSorb in combination with CVVHDF, which resulted in a reduction in his extremely high systemic myoglobin and CK levels, a sustained impairment of renal function was prevented, and the assumption is that the patient will benefit in the long term**
- **Safe and easy application of CytoSorb**