Improvement of hemodynamic and inflammatory parameters by combined hemoadsorption and hemodiafiltration in septic shock

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This case study reports on a 80-year-old male patient stable on chronic hemodialysis for more than 12 months who was admitted to emergency department after he collapsed at the end of a regular dialysis session.

Case presentation

• Past history included coronary artery disease with a myocardial infarction 14 months ago, end-stage renal disease due to nephrosclerosis, arterial hypertension and diabetes mellitus type II
• On examination, patient had fever (39.2°C), moist rales in bilateral lungs, O$_2$-saturation 79%, BP 126/60 mmHg, HR 130 beats/min, lactic acidosis with pH 7.1, APACHE II 33, SAPS II 48
• Later blood cultures remained negative, however, bronchoalveolar lavage was positive for Staph aureus
• Upon further deterioration of the circulatory situation, patient was diagnosed of having pneumogenic septic shock
• Intubation for mechanical ventilation and admission to ICU
• Immediate start on Ceftriaxone and Clarithromycin and 0.2 µg/kg/min noradrenaline
• On day 3 of the ICU stay the patient was in clinical need for renal replacement therapy
• Interleukin (IL) 6 level was elevated to 665 pg/m
• Due to clinical need for renal replacement therapy, a sharp increase of inflammatory markers, high need for catecholamines and septic shock with multiple organ failure CytoSorb was additionally installed into the CRRT circuit

Treatment

• One CytoSorb treatment session for 24 hours
• CytoSorb was used in conjunction with citrate dialysis (Multifiltrate; Fresenius Medical Care) in CVVHD mode
• Anticoagulation: citrate
• CytoSorb adsorber position: pre-hemofilter

Measurements

• Demand for catecholamines
• Inflammatory parameters (IL-6, PCT, CRP, leucocytes)
• Renal function (creatinine)
Results

- Noradrenaline could be reduced from a maximum of 3.0 to 0.4 µg/kg/min while MAP remained stable.
- Values of IL-6, CRP, creatinine, procalcitonin, and leukocytes decreased during treatment.
- Antibiotic therapy was performed without necessity to adjust doses at any time during CytoSorb treatment.

Patienten Follow-Up

- Values of inflammatory markers continued to decrease in the following days.

CONCLUSIONS

- Clear stabilization and consolidation of hemodynamics and inflammatory mediators under CytoSorb.
- Treatment appeared to be safe and was well tolerated by the patient.