Septic shock secondary to β-hemolytic streptococcus-induced necrotizing fasciitis treated with a novel cytokine adsorption therapy

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This case study reports on a 60-year-old female with no pre-existing diseases except hypertension and hypothyroidism presented at the hospital with radius fracture of the right forearm after an accident.

Case presentation
- Immediate wound care was achieved by application of a plaster splint followed by operative osteosynthesis on the same day
- Swelling of the forearm expanding to the upper arm
- Patient collapsed and was transferred to ICU with diagnosis of septic shock
- Antibiosis and volume therapy were initiated while requirement for vasopressors drastically increased
- Development of oliguric acute renal failure and ARDS and commencement of mechanical ventilation
- Implementation of continuous veno-venous hemofiltration in combination with CytoSorb
- In the further course proof of infection with β-hemolytic streptococci

Treatment
- Three CytoSorb hemoperfusion sessions on the first day as well as on day 3 and 4 after ICU admission in combination with standard CVVHD
- Treatment time was 36 hours in the first and 17-18 hours in the two following procedures
- Blood flow rates 100 ml/min
- Regional citrate anticoagulation

Measurements
- Markers of inflammation, organ dysfunction and need for vasopressors
- Leucocytes, platelets, IL-6, cumulative urine output, creatinine

Results
- CytoSorb effectively and significantly reduced IL-6 levels
- After the first session, IL-6 plasma concentration decreased from 70000 to 39100 pg/ml (-44.3%). The final IL-6 level after the third session was 66 pg/ml
- CytoSorb treatment was paralleled by a significant decrease of vasopressor need
- Antibiotic therapy was conducted with Ampicillin and Fosfomycin, with no reported adaption of dosage during CytoSorb therapy
- The patient could be successfully stabilized until surgical control of the infectious source was achieved
**Patient Follow-Up**

- After the third CytoSorb treatment hemofiltration was continued without CytoSorb as the need for vasopressors was significantly decreased and IL-6 levels were back in a normal range
- Despite considerable reduction of IL-6 levels, amputation was inevitable
- The general condition improved and the patient could be extubated 4 days after the third CytoSorb treatment

**CONCLUSIONS**

- Treatment was safe and well-tolerated, without adverse events
- CytoSorb significantly reduced IL-6, a predictor of mortality in sepsis and surrogate for cytokine storm
- The patient could be successfully stabilized until surgical infectious source control was performed
- CytoSorb in combination with CVVHD and regional citrate anticoagulation could be run continuously for up to 36 h
- Hemoadsorption using CytoSorb seems to represent a promising approach for an effective and safe treatment of severe sepsis and septic shock.