

Use of CytoSorb in a patient with septic shock in necrotizing fasciitis

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This case reports on a 68-year-old patient who presented in the emergency department with phlegmonous skin alterations and pain in the right lower leg, fever (39.7°C) as well as tachypnea (respiratory rate 31/min).

Case presentation:

- Known medical history included Chronic Obstructive Pulmonary Disease (COPD) due to pronounced nicotine abuse, polyarthritis, central artery occlusion of the right eye, depression, recurrent pain from the spine with degenerative alterations, and arterial hypertension
- Initiation of fluids as well as antibiotic therapy with piperacillin/tazobactam and clindamycin while still in the emergency room
- Due to the phlegmon on his lower leg and an increasingly impaired clinical condition, he was immediately transferred to the intensive care unit for stabilization and surgical preparation with an urgent indication for surgical intervention
- Within a few minutes, his hemodynamic situation deteriorated drastically, requiring the initiation of catecholamine therapy (norepinephrine 0.44 µg/kg/min)
- The patient further developed acute anuric renal failure
- Already two hours after the first contact in the emergency department, emergency surgical fasciotomy and necrosectomy was performed
- Post-operative transfer back to the intensive care unit intubated and ventilated with progressively increasing doses of norepinephrine (norepinephrine 0.49 µg/kg/min)
- At this time, laboratory diagnostics showed significantly increased inflammatory markers (leukocytes 15.4/nl, CRP 51.8 mg/dl, PCT 16.8 ng/ml) and retention parameters (creatinine 2.09 mg/dl, urea 72 mg/dl)
- Due to the septic shock with pronounced hemodynamic instability with increasing catecholamine doses and persistent anuria, continuous renal replacement therapy (CRRT) together with CytoSorb hemoadsorption was started two hours postoperatively

Treatment

- Two consecutive treatments with CytoSorb over a period of 72 hours (1st treatment for 24 h, 2nd treatment for 48 h)
- Cytosorb was used in conjunction with CRRT (Multifiltrate, Fresenius Medical Care) in CVVHD mode
- Blood flow rate: 100 ml/min
- Anticoagulation: heparin
- CytoSorb adsorber position: pre-hemofilter

Measurements

- Hemodynamics and catecholamine demand
- Inflammatory parameters

Results

- Within the next 72 hours, his hemodynamic situation stabilized significantly accompanied by a clear reduction in norepinephrine doses (0.2 µg/kg/min) at the end of the hemoadsorption session. Norepinephrine could be completely stopped three days after the end of CytoSorb therapy
- Furthermore, treatment resulted in a clear control of the hyperinflammatory reaction. CRP decreased from 51.8 mg/dl to 21.4 mg/dl and PCT to 10.8 ng/ml during treatment

Patient Follow-Up

- Later, β-hemolytic streptococci group A (*Streptococcus pyogenes*) were detected in the wound swab and antibiotic therapy was retained due to proven sensitivity
- Further necrosectomies with vacuum-assisted wound therapy were necessary
- Complication-free extubation seven days after CytoSorb treatment
- Recurring spontaneous diuresis after 12 days and discontinuation of CRRT after a total of 14 days
- During his further stay, the patient developed another episode of pneumonia with respiratory insufficiency followed by intubation, volume and catecholamine requirements. Another CRRT session was performed from the 20th to the 24th day for fluid removal and ultrafiltration. However, over time the patient stabilized under standard intensive care therapy
- Further need for sedation and analgesia due to numerous therapeutic wound procedures (split skin grafts etc.)
- After an intensive stay of 42 days the patient was transferred to Intermediate Care and then to the normal ward
- Another 2 weeks later he could be discharged to his home environment

Conclusions

- In this patient with erysipelas and necrotizing fasciitis as well as fulminant septic shock, the combined treatment with standard therapy, CRRT and CytoSorb resulted in a significant improvement in hemodynamics, control of the inflammatory response and a consecutive improvement in his renal function
- In this case, CytoSorb might have also led to a direct elimination of streptococcal toxin
- According to the medical team, CytoSorb was deliberately used very early on in his treatment given the fulminant progression of the disease and may have made a significant contribution to the survival of the patient
- CytoSorb was safe and easy to use in combination with CRRT