

Application of CytoSorb in a case of infection-associated rhabdomyolysis

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This case study reports on a 55-year-old patient with history of arterial hypertension who was admitted with complaints of dyspnea and symptoms of respiratory infection.

Case presentation

- Patient developed fulminant manifest pneumogenic sepsis and acute respiratory distress syndrome (ARDS) with massive requirements for fluids and catecholamines for hemodynamic stabilization
- Drastically increased plasma concentrations of myoglobin and creatine kinase on top of his inflammatory response, indicative of massive infection-associated rhabdomyolysis
- Generalized compartment syndrome due to fluid overloading, elevated creatinine levels and acute liver injury as evidenced by hyperbilirubinemia.
- For treatment of his acute kidney injury grade III (crush kidney) and for negative fluid balancing, renal replacement therapy was initiated using a Genius device with an AV600S filter
- To lower inflammatory mediator and myoglobin levels, CytoSorb was additionally installed

Treatment

- Four consecutive sessions were run over periods of 20 hours each, separated from one another by a pause interval of 4 hours.
- Blood flow rates were 150 ml/min
- Anticoagulation was achieved using citrate.
- The CytoSorb adsorber was placed in pre-dialyzer position.

Measurements

- Laboratory: Myoglobin, Creatine kinase, C-reactive protein, IL-6, Procalcitonin, Creatinine, ALT, AST, Bilirubin, Leucocytes, Thrombocytes, Hct, Hb, Albumin, Glucose, Na/K
- Clinical: Urine output

Results

- During the course of the treatment, plasma concentrations of IL-6, procalcitonin, myoglobin and creatine kinase decreased significantly
- Levels of leucocytes, thrombocytes, alanine aminotransferase, and aspartate aminotransferase normalized over the 4 consecutive treatments
- The clinical situation improved considerably including improvement of the patient's respiratory situation and liver function
- Kidney function did not improve
- The course of hematocrit, Hb and platelet count provided no evidence for a potential lack of hemo- or biocompatibility of the CytoSorb treatment
- Antibiotic dosages did not have to be adjusted at any time

Patient Follow-Up

- Kidney function remained impaired after a total of 5 days on CytoSorb
- Patient was discharged at day 13 with ongoing renal failure and need for renal replacement therapy
- Two days after the last treatment with CytoSorb the patient could be extubated without further complications
- On Day 27, the patient was transferred to a respiratory weaning unit where the patient was subsequently successfully weaned off mechanical ventilation, with a discontinuation of CRRT and the recovery of renal function

CONCLUSIONS

- In this patient, the application of CytoSorb resulted in a significant reduction of cytokines (i.e. IL-6) but also had an important additive effect on myoglobin removal
- The effects seen in this patient are a sum of both adsorption techniques used (CVVH and CytoSorb)
- It remains speculative to what extent the effects seen can be ascribed to the application of the Cytosorb adsorber and therefore needs to be investigated in future randomized controlled trials