

Use of CytoSorb in a patient with septic shock and multiple organ dysfunction syndrome following recurrent acute necrotizing pancreatitis

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This case reports on a 32-year-old male patient admitted to the Max Hospital, Patparganj with upper abdominal pain associated with vomiting.

Case presentation

- The patient had a known history of chronic alcohol abuse and pancreatitis
- Physical examination revealed abdominal distention and tenderness, while cardiovascular and neurological evaluations were unremarkable
- Treatment was started with intravenous antibiotics (meropenem and amikacin) and fluid therapy
- He exhibited severe metabolic acidosis with a pH of 6.86, pCO₂ 25 mmHg, and a pO₂ of 90 mmHg
- Chest X-ray confirmed lower zone consolidations in the lungs
- The patient had difficulties breathing along with drowsiness and high blood sugar levels and was therefore transferred to the medical ICU
- Working diagnosis at this time was acute pancreatitis with concomitant diabetic ketoacidosis, bilateral pneumonia and metabolic acidosis
- Laboratory parameters revealed severe leucocytopenia (3.6*10³/μl), decreased platelet count 90*10³/μl and significantly elevated PCT levels (17.3 ng/ml), indicating a severe ongoing systemic hyperinflammatory response
- He also decompensated hemodynamically, necessitating the start of a norepinephrine infusion, which had to be increased to up to 0.3 μg/kg/min over time, and was further supplemented by the additional application of vasopressin (3 IU/h)
- APACHE II score was 19 and SOFA score 12
- Due to respiratory deterioration, the patient was intubated and put on invasive mechanical ventilation
- Additionally, continuous renal replacement therapy (CRRT) was initiated due to development of acute renal failure
- As the patient was not responding to standard therapy and his clinical condition was continuing to deteriorate, the decision was made to install a CytoSorb hemoadsorber into the already running CRRT circuit

Treatment

- Three CytoSorb sessions were run in total, each treatment was performed for 24 hours with pause intervals of 2 hours between each session
- CytoSorb was used in conjunction with CRRT (Prismaflex, Gambro) run in CVVHDF mode
- Blood flow: 180 ml/min
- Anticoagulation: none

Measurements

- Hemodynamics and vasopressor requirement
- Inflammatory status
- Metabolic acidosis
- Parameters of pancreatitis
- Severity scores

Results

- Treatment resulted in a significant improvement in hemodynamics as evidenced by a stable mean arterial pressure (MAP) above 65 mmHg with decreasing vasopressor dosages. Norepinephrine dosages could be reduced to 0.1 µg/kg/min after the first CytoSorb+CRRT therapy session. Vasopressor support could be completely stopped after the 2nd CytoSorb treatment
- During the course of treatment, PCT decreased from 17.3 ng/ml to 1.01 ng/ml while platelet and leucocyte count initially remained low but recovered over time
- Metabolic acidosis resolved as shown by a normalization in pH with the first 24 hours of treatment
- Also parameters pointing towards a severe pancreatitis could be efficiently reduced during treatment (pre CytoSorb therapy serum amylase 740.6 U/L and lipase 152.0 U/L, post 2nd CytoSorb therapy session serum amylase 148.2 U/L and lipase 33.1 U/L)
- The combined treatment was also associated with a reduction in SOFA score from 12 to 5 throughout the therapy interval

Patient Follow-Up

- The patient could be extubated on day 8 after admission with continuous improvement thereafter
- Alcoholic pancreatitis further improved with amylase and lipase plasma levels showing a declining trend
- On day 13 he was discharged from the hospital in a clinically stable condition

Conclusion

- In this patient with septic shock and multiple organ dysfunction syndrome the combined treatment of standard therapy, CRRT and CytoSorb resulted in rapid stabilization in hemodynamics with simultaneous resolution of metabolic acidosis, control of the overshooting inflammatory response and improvement in organ functions
- This case highlights that early initiation of CytoSorb therapy and sustaining the therapy helped in regaining control of the inflammatory process in this patient
- The use of CytoSorb together with CRRT proved to be safe with no signs of adverse events