First report of cytokine removal using CytoSorb in severe noninfectious inflammatory syndrome after liver transplantation

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In this report the authors present the case of a 46-year-old man with primary graft nonfunction after liver transplantation who underwent emergency retransplantation with an ABO-incompatible graft.

Case presentation

- 46-year-old man who underwent deceased donor liver transplantation (LT) for Hepatitis-B Virus (HBV) and alcoholic cirrhosis
- Postoperatively, the patient remained neurologically unresponsive, could not be extubated, and there was a massive increase in serum transaminases and bilirubin
- Hyperdynamic hemodynamic status with a high cardiac index (CI) and low systemic vascular resistance index (SVRI) requiring vasopressor support was noted immediately after surgery
- Laboratory results showed disseminated intravascular coagulopathy and one session of plasma exchange was performed for severe coagulopathy and cholestasis
- Acute graft dysfunction was diagnosed on the 1st postoperative day with emergency retransplantation (ABO incompatible) 36 hours after the first LT

Treatment

- CytoSorb was used in conjunction with CVVH during retransplantation for the entire duration of surgery (total treatment time of 7 hours) and on the first postoperative day with a treatment time of 12 hours
- CytoSorb was installed into the CVVH circuit (multiFiltrate® using an Ultraflux® AV 600S hemofilter, Fresenius Medical Care)
- Blood flow rates were 150 ml/min
- Anticoagulation was achieved using heparin
- Intraoperative immunosuppression consisted of 500 mg methylprednisolone and 20 mg basiliximab

Measurements

- Cytokine levels were measured at the beginning of surgery (T1), after graft reperfusion (T2), at the end of surgery (T3) and before (T4) and after (T5) the second CytoSorb treatment
- Hemodynamic parameters, biochemical assays and vasopressor support were noted

Results

- During the first treatment pro-inflammatory cytokines IL-1b, TNF-a, IL-6 and IL-8 levels decreased, anti-inflammatory cytokines IL-4, IL-13 were constant within the normal range, IL-10 and MCP-1 levels decreased 10-fold to about normal levels
- Improvement in hemodynamics with a stabilized MAP and a continuous decrease in vasopressor support (NE) during surgery (NE discontinued at the end of surgery)
- The use of CytoSorb during the second session was associated with an improvement in cardiac output and SVRI
- Lactate levels and central venous oxygen saturation (ScvO2) returned to normal values
- A decrease in platelet count was observed during both treatments (attributed to a multifactorial etiology: CVVH procedure, use of heparin, intraoperative blood loss, and possibly to the use of CytoSorb)
- The treatment was well tolerated with no obvious adverse effects
Patient Follow-Up

- Patient was extubated 12 hours after re-transplantation
- Liver function returned to normal within the next 5 days
- Discharge from the Post Anaesthesia Care Unit 7 days after retransplantation
- Discharge from hospital on the 35th postoperative day
- At the 4 months follow-up the patient was in good clinical state with normal liver function
- A normal liver function was also recorded at the 1-year follow-up

Conclusions

- First use of CytoSorb during CVVH in a patient undergoing re-transplantation with AB0 incompatible graft for Acute Graft Dysfunction
- The use of CytoSorb was associated with an excellent outcome in terms of improved hemodynamic parameters, rebalancing pro-inflammatory and anti-inflammatory cytokines and patient survival
- Hemoadsorption with CytoSorb may represent an approach to bridge patients with acute liver failure or Acute Graft Dysfunction to liver transplantation