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Case of the month 05/2023

Use of CytoSorb for bilirubin removal in ischemic hepatitis and multiple organ failure due to uterine rupture with massive postpartum hemorrhage

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This case reports on a 43-year-old pregnant woman, who was hospitalized for an anticipated complicated delivery.

Case presentation

- The patient had hypothyroidism and was additionally on antihypertensive medication (methyldopa). She had also suffered from persistent liver impairment with hyperbilirubinemia from admission to hospital
- Due to her medical condition, she was transferred to the Department of Anesthesia and Intensive Care for further management and induction of labor was performed at the 39-weeks gestation
- Postpartum, the patient suddenly developed pulseless electrical activity (PEA) which resulted in a cardiac arrest for 20 minutes. An uterine rupture was noted and treated by emergency hysterectomy with embolization of the right internal iliac artery and ligation of left internal iliac artery. During the operation, the patient developed abdominal compartment syndrome with hypoxemia and so she was eventually connected to veno-venous extracorporeal membrane oxygenation (VV-ECMO) therapy
- In addition to fluid substitution given her hypovolemic shock state high dose inotropic support was initiated
- In the postoperative period, she required mass blood transfusions to manage her postpartum hemorrhage
- Although the patient could eventually be weaned from ECMO, she developed signs of ischemic hepatitis accompanied by massive liver failure with serum bilirubin levels increasing to over 64 mg/dL on day 10 after ICU admission
- Simultaneously, she developed acute renal failure, resulting in the initiation of continuous renal replacement therapy (CRRT)
- Moreover, she was noted to be in atrial fibrillation with short pause intervals, followed by severe bradycardia (heart rate 40-50 bpm) and asystole for 2 minutes. Therefore, transvenous pacing (TVP) was inserted by the cardiologist for severe bradycardia
- With the rationale to reduce her elevated bilirubin levels, a CytoSorb adsorber was integrated into the CRRT circuit

Treatment

- A total of three treatment sessions of CytoSorb were run consecutively for a total of 52 hours
- The CytoSorb absorber was installed pre-hemofilter into the CRRT circuit (AV1000S, multiFiltrate, Fresenius)
- Blood flow rate: 80-100 ml/min

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Measurements

- Bilirubin serum levels

Results

- CytoSorb treatment led to a reduction in serum bilirubin levels from 64 to 33 mg/dL within 12 hours of initialization. A slight rebound of bilirubin was observed and a second CytoSorb treatment was started. The patient's serum bilirubin remained stable during CytoSorb treatment and continued to decrease over time

Patient Follow-Up

- The patient was eventually weaned from TVP two days after discontinuation of CytoSorb treatment as her heart rate returned to normal sinus rhythm
- Over time, her clinical condition further stabilized and liver as well as renal function progressively improved, both returning to normal values
- She was discharged home four months later after a prolonged course of rehabilitation with her healthy baby

Conclusion

- To the best of the authors knowledge, this is the first case that describes the use of CytoSorb for bilirubin removal in multiple organ failure, including cardiac arrest, ischemic hepatitis and renal failure following severe postpartum hemorrhage postpartum with uterine rupture
- In this complex and multifactorial scenario, implementation of CytoSorb treatment successfully reduced the patient's serum bilirubin level and was associated with improved liver and cardiac function, and eventually enabled weaning-off from transvenous pacing within a short time period
- These data further support the use of hemoadsorption for bilirubin removal while treatment with CytoSorb was safe and feasible without technical problems