Use of Hemoadsorption in a Case of Severe Hepatic Failure and Hyperbilirubinemia

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Dear Editor,

Acute severe hepatic failure associated with persistent severe hyperbilirubinemia is a rare but life-threatening critical illness typically affecting multiple other organs including renal and cerebral function [1]. We report the case of a 59-year-old male patient with medical history of lymphoblastic lymphoma, adipositas per magna (BMI 43), steatohepatitis, arterial hypertension, renal cysts, and a preceding laparoscopic cholecystectomy. After completion of therapy with rituximab and bendamustine for lymphoblastic lymphoma, the patient presented for a follow-up check at our hospital. With respect to the lymphoma, there was no evidence for remaining tumor activity. However, laboratory testing revealed significantly elevated transaminases (GOT 241 U/L, GPT 196 U/L) as well as increased total bilirubin serum levels (2.3 mg/dL), while retention parameters were within the normal range. In the further course, active hepatitis B was diagnosed (viremia >100,000 copies/mL) and therapy with entecavir was initiated. On day 9 after admission, the patient developed acute kidney injury [2] (oliguria <0.2 mL/kg/h, creatinine 2.79 mg/dL, Kidney Disease: Improving Global Outcomes [KEDIGO] level 3), and was admitted to the intensive care unit for escalation of therapy (application of maximum therapy, advanced monitoring and use of extracorporeal organ support). Continuous venovenous hemodiafiltration using re-

gional citrate anticoagulation (Multifiltrate CiCa[®], FMC, Bad Homburg, Germany) in combination with CytoSorb (CytoSorbents Inc., USA) added in predialyzer position was initiated to rebalance the excessive hyperbilirubinemia, hence to salvage kidney function at bilirubin levels reaching 39.5 mg/dL (GOT

988 U/L, GPT 792 U/L). This combined extracorporeal support was performed for 7 consecutive days. The course of laboratory findings during treatment is depicted in Figure 1. Bilirubin levels could be reduced from a maximum of 39.5–17.3 mg/dL and continued to decrease in the following days. Notably, we were not able

Fig. 1. Course of bilirubin, ammonia, and IL-6 during the hemoabsorption treatment over 7 days.

to reduce levels below 10 mg/dL and adsorber cartridges had to be exchanged every 18 h as serum concentrations seemed to rebound during treatment, which points towards a saturation of the hemoadsorption device. Liver transaminases continuously decreased until treatment day 7 (GOT 86 U/L, GPT 73 U/L) to values slightly elevated above the upper limit of normal. Initial hepatic encephalopathy (HE 2, CAM-ICU++) did completely resolve during the treatment period and NH_3 levels decreased to normal levels. Values of IL-6 during treatment diminished; however, the patient did not exhibit an acute inflammatory reaction at any time. Importantly, kidney function could not be improved considerably. After discontinuation of therapy, we observed

a rebound in bilirubin levels to 20 mg/dL. Three days after completion of therapy, liver and kidney function improved and urine output reached stable values of 0.4 mL/kg/h while still performing intermittent hemodialysis every 48 h. However, despite intensified antiviral therapy in the further course, the deleterious progression of hepatitis B could not be stopped and the patient died within the next days. This is the first clinical case report describing the use of CytoSorb hemoadsorption during hyperbilirubinemic hepatic dysfunction due to active hepatitis B infection. The treatment was safe and well tolerated. A decrease in bilirubin and IL-6 levels in combination with an improvement in hepatic encephalopathy are the main results to be drawn from this

report. This is in line with several case reports [3–5]. In conjunction with similar previously published case reports, a controlled study examining the true effects of the device would be desirable.

Disclosure Statement, Financial Support, and Informed Consent

The authors declare that none of them has conflicts of interest associated with this report. Furthermore, there was no financial support for this study. Authors have declared that this study was performed in accordance to the research ethical guidelines. Informed consent to use clinical data for retrospective evaluation was obtained from the patient.

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