

Continuous hemodialysis therapy for a very low birth weight (VLBW) premature with acute renal failure and congenital heart disease

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Case description – The premature girl was born at 32 weeks of gestation with a birth weight of 1495g and Tetralogy of Fallot (TOF) with severe infundibular and valvular pulmonic stenosis as well as hypoplastic pulmonary arteries. Due to progressive hypoxic spells, at the age of 31 days an aortopulmonary shunt (diameter: 3,5mm) was placed. Postoperatively, the girl developed a pronounced capillary leak syndrome with acute renal failure. Peritoneal dialysis was started at the age of 32 days. Due to an intestinal perforation on day 43, a bowel resection with ileostomy was performed. Nevertheless peritoneal dialysis was continued, fluid retention increased and mechanical ventilation worsened.

The primary technical challenge for initiating continuous hemofiltration in this VLBW premature with an actual weight of 1800g was the size of the catheter for continuous veno-venous hemofiltration and the capacity of the hemofiltration set. We successfully placed the smallest available short term dialysis catheter with a diameter of 6-French (Joline, Hechingen) into the right jugular vein. Hemofiltration was initiated with the Plasauto Sigma-System (DIAMED, Cologne). Following the priming of the hemofiltration set (filling volume of the set: 47ml) with heparin and sodium chloride, the set was filled with a mixture of red cell concentrate (75%), fresh frozen plasma (25%) and sodium bicarbonate (2ml). On hemofiltration, the set was run with the blood pump of 7-10ml/min, an ultrafiltration rate between 10-30ml/h and a replacement fluid rate of 100ml/h. Despite effective anticoagulation with heparin and a prothrombin time over 60 seconds and anti-factor Xa over 0,4 IU/ml the major complication was clotting of the hemofiltration sets venous line connected to the patients venous vascular access. As a result of the clotting, the hemofiltration set had to be changed 12 times (in average every 39,15 hours). Uremia and lung function improved quickly. Hemofiltration was needed over 29 days, renal function recovered completely. A clipping of the aortopulmonary shunt to reduce pulmonary blood flow was performed 8 days after admission. The patient was discharged home after 88 days.

Conclusions – Continuous hemodialysis therapy is a successful and safe possibility even in VLBW prematures with acute renal failure.