WHEN AKI BECOMES CKD WITH NEED FOR SUBSTITUTIVE TREATMENT IN PRETERM LOW BIRTH WEIGHT NEWBORNS: EXPERIENCE WITH A MINIATURIZED DEVICE

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CASE REPORT

A baby boy born at 33+3 weeks of gestational age, was referred to our Division at 48h for oligo-anuria (urinary output: 0.4 mL/kg/h). Birthweight was 2340 gr. The pregnancy was complicated by severe oligohydramnios and ultrasound suspect of posterior urethral valves, confirmed after birth.
At birth the newborn experienced respiratory distress with anterior pneumothorax; intubation and mechanical ventilation were immediately started and a urinary catheter was placed. Serum creatinine was 1.6 mg/dl, with normal acid-base and electrolytes balance.

Maximal diuretic stimulus and cutaneous ureterostomy allowed only partial diuresis increase.
The gradual worsening of retentive indices (maximum serum creatinine: 4 mg/dL, with estimated GFR according to Schwartz Formula for preterm infants 3 mL/min/1.73 m2) and fluid overload, the persistence of mechanical ventilation need and the unstable hemodynamic status indicated renal replacement therapy.

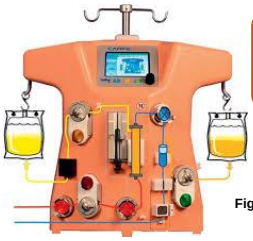

Figure 1 – CARPEDIEM device

CONTINUOUS RENAL REPLACEMENT THERAPY

Automated peritoneal dialysis (APD) was excluded due to ureterostomy presence and mechanical ventilation need in a low weight newborn.
Continuous Renal Replacement Therapy (CRRT) was therefore started, after placing a central vascular access in the left femoral vein.
We used the dialysis device CARPEDIEM® (Cardio-Renal Pediatric Dialysis Emergency Machine), choosing a continuous veno-venous hemodialysis program (CVVHD) with heparin anticoagulation.

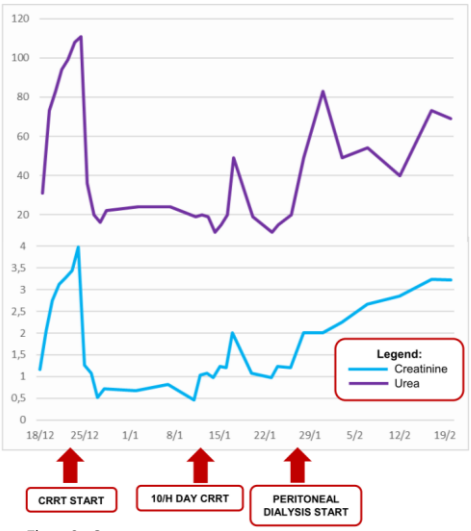

Figure 2 – Serum creatinine and urea trend from birth to discharge

CRRT was continuously performed for 403 h, then intermittently (10 h/day) for 16 more days. In 10 days fluid overload was resolved allowing weaning from mechanical ventilation; serum creatinine and urea concentrations were managed safely and effectively during the treatment entire duration.
No metabolic, cardiovascular or thrombotic complications developed during CRRT.

At 36 days of life the baby was switched to APD and was discharged from the hospital at two months of life in normal conditions, adequate development for being now at term at 39 weeks, under chronic renal replacement therapy with APD.

CONCLUSIONS

In conclusion, a prolonged CRRT with CARPEDIEM® device allowed a progressive stabilization of hemodynamics, a gradual control of fluid overload and prolonged term blood purification in a safe and effective modality, enabling the child growth to a size when APD could be safely started.
The child is now 9 months old, with normal psychosomatic development still under APD and will be waitlisted for kidney transplantation when he will reach the adequate body size.

38th Vicenza Course on AKI&CRRT
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