Management of Acute Severe Preoperative Hyponatremia in a Two Year Old Undergoing Living-related Kidney Transplantation

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Case Report:

A 2 year old, 13.9 kg, female with a past medical history significant for end-stage renal disease secondary to neonatal ischemia from twin-twin transfusion and acute tubular necrosis presenting for maternal living-related kidney transplant.

Day before surgery preoperative labs were significant for: Na+=128 mmol/L, K+=2.9 mmol/L, and Cr=5.12 mg/dL. Prior week labs were: Na+=134 mmo/L and K+=3.6 mmol/L. Due to the hypokalemia, peritoneal dialysis was held on the night prior to surgery. Metabolic panel recheck on the morning of surgery showed worsening hyponatremia, Na+=121 mmol/L. By the time the critical lab was reported, the donor kidney was already harvested and the patient was not exhibiting neurologic signs related to severe hyponatremia (seizures or altered mental status).

The management of this patient was discussed with the transplant/urology surgeons, nephrologist and anesthesiologist and the decision was made to proceed with surgery. After the risks were discussed with the family, a 24 G peripheral IV was placed and the patient was taken to the OR. Under IV sedation, a left subclavian central line was placed to administer 100 ml of 3% NaCl over an hour with the goal to correct the sodium back to upper 120's. Repeat sodium level was 129 mmol/L. The patient’s neurologic status remained stable without signs of deterioration. General anesthesia was induced and a successful renal transplant followed.

Post operative course was complicated by the need for mechanical ventilation and sedation due to fluid overload and respiratory failure. Once weaned from the ventilator and sedation, her neurologic status remained intact with no signs of sequelae from the hyponatremia or its correction.

Discussion:

Mild hyponatremia is a common electrolyte abnormality seen in the postoperative period(1). Severe hyponatremia (Na+ < 125 mmol/L) can be life threatening and is associated with an increased risk of perioperative morbidity and mortality(2,3). Children that become acutely hyponatremic are more likely to exhibit minor symptoms including headache, nausea, and weakness or develop major symptoms, such as, seizures or cerebral edema. These symptoms can be difficult to detect in younger children and are likely to be masked by anesthesia. Medical management of hyponatremia in a controlled fashion is preferable prior to surgery given the risks of either developing symptomatic severe hyponatremia or overcorrection(4). No pediatric literature exists on the perioperative management of severe hyponatremia for urgent/emergent surgery. We present an anesthetic approach on the perioperative management of a patient with severe hyponatremia urgently needing renal transplantation.

References: