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Salt, sweat and unclear? Diaphoresis and hypernatremia in end-stage kidney disease: Questions

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Keywords

hypernatremia; diaphoresis; end-stage kidney disease

Case 1

A 19-month-old boy with end-stage kidney disease (ESKD) on peritoneal dialysis (PD) presented with two days of profuse sweating without fever. His past medical history was significant for prematurity (35 weeks gestational age), a solitary pelvic dysplastic kidney, pulmonary hypoplasia, tethered cord, umbilical hernia, gastroesophageal reflux disease (GERD), and gastrostomy tube (G-tube) dependency. His medications at that time included: calcitriol, calcium carbonate, epoetin alpha, ferrous sulfate, bethanecol, simethicone, diphenhydramine, growth hormone, and omeprazole.

His mother reported that for the two days prior to evaluation he was noted to be diaphoretic, soaking through his clothes and sheets. Notably, he was afebrile during this period. He had been relatively playful, although she did note his urine output was decreased. His PD fluid was clear, and he did not have any abdominal pain or change in appetite. Given the concern for infection, he was referred to the hospital.

Physical exam was notable for tachycardia (heart rate 160) with otherwise normal vital signs. His weight was 320 grams below estimated dry weight (4 % dehydration). He was well-appearing with slightly dry mucus membranes, a reducible small umbilical hernia, and otherwise normal exam with unremarkable PD catheter and G-tube sites.

Laboratory evaluation was significant for a serum sodium of 154 mmol/L with otherwise normal electrolytes, unremarkable complete blood count, normal thyroid function testing,

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and PD fluid cell count of 107 white blood cells/ μ L with 10 % segmented neutrophils. Blood and peritoneal bacterial cultures showed no growth.

He received a normal saline bolus and then was initiated on a continuous infusion of D5 water to correct his hypernatremia. Given the concern for an infection he was initially treated with vancomycin and cefepime.

Case 2

A 3-year-old boy with ESKD on hemodialysis (HD) presented over several months with significant diaphoresis in the absence of fevers. He underwent multiple evaluations for infection which were unrevealing. His past medical history was significant for autosomal recessive polycystic kidney disease, status post bilateral nephrectomies, hypotension and presumed dysautonomia, congenital hepatic fibrosis, pulmonary hypoplasia and associated chronic lung disease with tracheostomy dependence, G-tube dependence, GERD, and a seizure disorder. His medications at that time included: calcitriol, calcium carbonate, epoetin alpha, ferrous sulfate, simethicone, omeprazole, bethanecol, fluticasone, albuterol, and levetiracetam.

Physical exam was notable for tachycardia and hypotension, but he was 1 kg above estimated dry weight. He was well-appearing with moist mucus membranes, stable hepatosplenomegaly, well-healed surgical scars, unremarkable tracheostomy and HD catheter sites, and otherwise normal exam. Laboratory evaluation was significant for a serum sodium of 153 mmol/L with otherwise normal electrolytes and leukocytosis. Blood cultures showed no growth.

He received a normal saline bolus and given the initial concern for infection, was treated with vancomycin and cefepime.

Questions

1. What is the differential diagnosis for diaphoresis in patients with ESKD?
2. What is the explanation for the hypernatremia in these two patients?
3. What is the most likely cause for the findings in these two patients?