A 5 mo. male patient is brought to the ED by his mom, with a history of vomiting x 3 today, associated with decreased activity level. Patient had been drinking well until today, and mom is mixing the formula using 6oz water/2 scoops of powder, and he is also taking 1 oz. water 4x day. PE: W: 50%, L: 15%, HC: 15%, PR: 162, BP: 87/52, RR:32. Remarkable for decreased LOC, Bilateral dilated pupils, poorly reactive. LCTA bilaterally, no retractions. RRR, no murmurs. Abdomen soft, non-tender, non distended. No HSM. Cap refill 3 secs.

5 minutes after you leave the room, your patient start seizing...
Which of the next set of labs would you expect to find on this patient:

A. Gl: 26, Na: 137, Cl: 100, K: 3.8, CO2: 22, BUN: 9, Cr: 0.3
B. Gl: 62, Na: 117, Cl: 90, K: 5.6, CO2: 16, BUN: 6, Cr: 0.4
C. Gl: 76, Na: 130, Cl: 95, K: 5.3, CO2: 12, BUN: 6, Cr: 0.4
D. Gl: 52, Na: 128, Cl: 90, K: 2.7, CO2: 16, BUN: 12, Cr: 0.4
• Which of the next set of labs would you expect to find on this patient:

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HYPONATREMIC SEIZURES

• Hyponatremia $\rightarrow$ influx of water into the intracellular space $\rightarrow$ cellular swelling $\rightarrow$ cerebral edema and encephalopathy

• The clinical manifestations are primarily neurologic

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<th>Anatomic Changes</th>
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<td>Pressure on rigid skull</td>
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<td>Tentorial herniation</td>
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HYPONATREMIC SEIZURES

• Children → high risk for developing symptomatic Hyponatremia → higher brain-to-skull size ratio
• Symptomatic Hyponatremia
  ▫ SIADH
  ▫ Post-operative Hyponatremia
  ▫ Oral water intoxication → one of the most common causes of symptomatic Hyponatremia in healthy infants; 70% of infants <6 mo. who develop seizures that have no apparent cause are found to have Hyponatremia due to water intoxication.
  ▫ Diuretics
• What is the next best step in the management?

A. 25% dextrose bolus 2ml/kg IV

B. Normal saline bolus 20ml/kg

C. Start D5 1/4 NS maintenance fluids.

D. Fosphenytoin 20mg/kg and fluid restriction

E. Hyper Sal (3%) 1ml/kg – 8ml/kg per hour or until seizure activity ceases.
• What is the best next step in the management...

A. 25% dextrose bolus 2ml/kg IV
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C. Start D5 1/4 NS maintenance fluids.
D. Fosphenytoin 20mg/kg and fluid restriction
E. Hyper Sal (3%) 1ml/kg – 8ml/kg per hour or until seizure activity ceases.
HYPONATREMIC SEIZURE

• Affected patients should be treated with hypertonic saline (3%)

• The rate of infusion should raise the Na concentration by about 1 mEq/L (1 mmol/L) per hour until either the patient becomes alert and seizure-free/ Na increases by 20-25 mEq/L / Na of 125 to 130 is achieved, whichever occurs first.
HYPONATREMIC SEIZURE

• If the patient is seizing or showing other signs of increased ICP infusion rate should be increased to raise the Na level by 4 to 8 mEq/L during the first hour or until the seizure activity ceases.

• Assuming that total body water comprises 50% of total body weight, 1 mL/kg of 3% NaCl in water will raise the Na by about 1 mEq/L (1 mmol/L).
REFERENCES

THANK YOU!