If you’re preparing for the United States Medical Licensing Examination® (USMLE®) Step 2 exam, you might want to know which questions are most often missed by test-prep takers. Check out this example from Kaplan Medical, and read an expert explanation of the answer. Also check out all posts in this series.

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This month’s stumper

A 24-year-old man is being evaluated for a declining sodium level. Four days ago he suffered a subarachnoid hemorrhage from a ruptured cerebral aneurysm. The hemorrhage was evacuated, the aneurysm was clipped, and the patient has slowly recovered. He is now in stable condition on the neurosurgical ward. His plasma sodium, however, decreased from 138 mEq/dL to 130 mEq/dL and then to 128 mEq/dL.

He has been mildly fluid restricted to 1.5 L per day, which seems to have slowed the rate of sodium decline. The patient seems clinically euvoletic but has fairly concentrated urine, manifested by a high urine osmolality and specific gravity. Urine studies also reveal salt wasting, with an elevated total urinary sodium level and elevated fractional excretion of sodium. A review of the patient's other laboratory studies is remarkable only for a low uric acid level.

If this man’s sodium continues to decrease, which of the following is an appropriate intervention?

A. D5 water bolus.

B. Demeclocycline.
C. Desmopressin.
D. Half-normal saline.
E. Normal saline.

The correct answer is B.

Kaplan Medical explains why

This patient has syndrome of inappropriate antidiuretic hormone (SIADH) release, which can occur in patients who have head trauma or any major central nervous system procedure and also is classically associated with small-cell carcinoma of the lung. This patient is clinically euvolemic and has a high urine osmolality and specific gravity, as most water is retained in the distal tubule of the kidney. The fractional excretion of sodium is high, however, as water without salt is retained.
Treatment generally involves fluid restriction followed by loop diuretics (which lose relatively more water than salt) and, if necessary, sodium tablets. In patients who cannot tolerate aggressive fluid restriction for one reason or another, or in whom aggressive treatment is warranted (such as post-trauma patients already primed for seizure activity), ADH antagonists such as demeclocycline and lithium can be used.

Why the other answers are wrong

**Choice D, A and E:** Intravenous fluids such as half-normal saline, D5 water (5% dextrose), and normal saline should be avoided. The excess ADH ensures that the water administered is absorbed in the distal tubule, whereas the salt is excreted.

**Choice C:** Desmopressin is an ADH analogue and would worsen this patient's condition. It is used in the treatment of central diabetes insipidus, which results from a lack of effective ADH secretion.

Tips to remember

- SIADH classically occurs in patients with head trauma and as a paraneoplastic syndrome associated with small cell lung cancer.
- Management includes fluid restriction, salt tablets, and loop diuretics.

For more prep questions on USMLE Steps 1, 2 and 3, view other posts in this series.

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