Kaplan USMLE Step 3 prep: Patient has tonic-clonic seizure

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If you’re preparing for the United States Medical Licensing Examination® (USMLE®) Step 3 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.

This month’s stumper

A 37-year-old woman with history of bipolar disorder is brought to the emergency department in an obtunded state. The patient has been maintained on a stable dose of lithium carbonate, 600 mg by mouth, twice a day for the last five years. On examination she has a tonic-clonic seizure lasting approximately 30 seconds. As part of the laboratory workup, the patient’s lithium level is found to be 4.2 mEq/L.

After basic airway and cardiovascular support, which of the following is the most appropriate next step in management?

A. Loading dose of phenytoin.
B. Renal consult for emergent dialysis.
C. MRI of the patient’s head.
D. Conservative management, including fluid and electrolyte replacement.
E. Liver function tests.


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The correct answer is B.

Kaplan Medical explains why

The patient presents to the emergency department with potentially life-threatening lithium toxicity. Hemodialysis is the treatment of choice for lithium level greater than 4.0 mEq/L or a manifestation of symptoms of lithium toxicity such as mental status changes and seizures.

Why the other answers are wrong

**Choice A:** Loading dose of phenytoin is not indicated after one generalized seizure, when metabolic encephalopathy can be treated with dialysis.

**Choice C:** Head MRI may be an acceptable follow-up study after the patient receives dialysis, especially if the seizures continue after dialysis treatment.

**Choice D:** For lower levels of lithium toxicity, fluid and electrolyte replacement may be sufficient treatment.

**Choice E:** Hepatic toxicity, as demonstrated by liver function tests, is not suggested by the patient's presentation in the presence of lithium level greater than 4.0 mEq/L, given lithium's exclusively renal metabolism.
Tips to remember

Indications for hemodialysis in patients with lithium toxicity:

- Serum-lithium level is greater than 4.0 mEq/L.
- Signs of lithium toxicity, such as seizures and mental status changes, regardless of serum-lithium level.

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

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