

Bismuth encephalopathy masquerading as hypernatremia and urinary tract infection



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BACKGROUND

- Bismuth encephalopathy is a rare manifestation of bismuth toxicity characterized by progressive confusion, myoclonus, astasia-abasia, dysarthria, and/or neurologic findings such as hallucinations, paresthesias, and seizures.

CASE PRESENTATION

- A 74 year old female with a history of colitis and hyperlipidemia was sent from a nursing facility for confusion and tremors.
- Her exam was positive for hyperactivity, inappropriate behavior, orientation only to self, resting tremors, myoclonus, ataxia, and choreatic movements.
- She was admitted for urinary tract infection (UTI) and hypernatremia.
- The infection and sodium were corrected but the patient was still confused, tremulous, and had nonsensical speech.
- It was then discovered that she has been taking 1.05 – 2.10 g of bismuth subsalicylate every day for the past 4 years.
- Her initial blood bismuth concentration was 327 mcg/L (ref <50 mcg/L). We recommended supportive care and cessation of bismuth compound use.
- On day 4 of admission, her electrolytes and renal parameters had normalized. A repeat bismuth concentration was 197.5 mcg/L. An EEG and MRI were unremarkable.
- On day 9 of hospitalization she was alert but still mildly confused and tremulous. She was transferred back to her nursing facility with loperamide to manage symptoms of colitis.

PEPTO BISMOL PACKAGING



INITIAL EXAM

INITIAL VITAL SIGNS:

HR 81 bpm, BP 129/109 mm Hg, RR 19 bpm, SpO2 100% on RA.

INITIAL LABORATORY RESULTS:

- | | |
|-----------------|-------------------|
| • Na 163 mEq/L | AST 37 U/L |
| • K 4.2 mEq/L | ALT 24 U/L |
| • Cl 127 mEq/L | Ca 10 mg/dL |
| • Mg 3.4 mg/dL | ASA < 1 mg/dL |
| • BUN 54 mg/dL | APAP < 10 mg/dL |
| • Cr 1.06 mg/dL | Bismuth 327 mcg/L |
| • CO2 24 mEq/L | |

DISCUSSION

- A detailed toxicological history is important for all patients with altered mental status (AMS) since both medical and toxicologic illnesses can occur simultaneously.
- The history of 4 years of daily therapeutic doses of bismuth subsalicylate and her persistent neurological findings despite resolution of hypernatremia and antibiotics increased the suspicion for bismuth encephalopathy.
- The manufacturer recommends no more than 2 days of bismuth therapy.
- Background blood concentrations of bismuth in the general population are <50 mcg/L, however absolute concentrations correlate poorly with morbidity.
- We did not recommend chelator therapy in this patient but prior cases report use of BAL, DMPS, succimer, and D-penicillamine and with arguable efficacy.
- There are several other case reports of bismuth toxicity in patients with a history of chronic colitis who were self-treating with bismuth subsalicylate. Her history of chronic colitis may have predisposed her to becoming bismuth toxic.

CONCLUSIONS

- The signs and symptoms in this case correlated significantly with bismuth encephalopathy but were confounded by a UTI and hypernatremia.
- Toxicologic illness can occur concurrently with, and be masked by, overt medical illness. A detailed toxicologic history should be attempted for all patients with altered mental status.
- Chronic colitis patients may be at higher risk for developing bismuth toxicity.

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