

Severe Thallium Toxicity Treated Successfully with Prussian Blue and CVVH

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Background: Thallium is a transition metal implicated in intentional and unintentional toxicity secondary to historical medical uses, industrial uses, intentional poisoning and accidental exposure. We present a patient with severe thallium toxicity who was treated successfully with multiple modalities including Prussian blue and continuous veno-venous hemofiltration (CVVH) with eventual clinical improvement.

Case Report: A previously healthy 41-year-old man presented with severe, symmetric, progressive bilateral lower extremity sensorimotor neuropathy. He was diagnosed with Guillain-Barre Syndrome, treated with intravenous immunoglobulin and steroids, and transferred to a rehabilitation facility. Subsequently, he developed progressively worsening encephalopathy and was readmitted. Comprehensive evaluation was non-diagnostic. After alopecia developed, thallium toxicity was suspected. A serum heavy metal test was obtained and was notable for a thallium level of 158 ng/mL (0-1 ng/mL).

The patient was started on CVVH and received multi-dose activated charcoal until Prussian blue was obtained from the CDC. Both Prussian Blue and CVVH were continued for 3 weeks. His inpatient hospital course was complicated by waxing and waning encephalopathy and severe bilateral lower extremity pain. Repeat thallium levels initially increased to 197 ng/mL four days later following initiation of therapy. Serum thallium levels then trended down to 53 ng/mL after one week, and 6 ng/mL after three weeks. Urine thallium levels declined from >800 mcg/L (0-1 mcg/L), to 15 mcg/L over three weeks. The patient had significant improvement in neurologic symptoms and encephalopathy and was discharged to a rehabilitation center.

Discussion: Thallium toxicity should be suspected in patients with encephalopathy, painful neuropathy, and alopecia. Treatment consists of oral Prussian blue, which binds recirculating thallium in the GI tract, and CVVH, which enhances the elimination of thallium.

Conclusions: This case illustrates that aggressive treatment, even weeks after initial presentation, can decrease the thallium body burden and result in clinical improvement of neurologic toxicity.