

Background

Acute paralysis is a medically emergent syndrome that should be addressed quickly in the emergency room and properly assessed in the inpatient setting. The differential diagnosis often includes rare conditions that can be puzzling to the diagnostician. Here, we present an interesting case of thyrotoxic periodic paralysis (TPP).

Clinical Case

CC: 24 y/o active duty male in for sudden weakness in lower extremities. HPI: Patient woke up with inability to stand from bed. Had diffuse weakness in his legs and some weakness in his arms but no loss of sensation and no pain in extremities. Denied any trauma. Denied any recent illness or sick contacts **PMH:** Has no known chronic illnesses and does not take any medications **PE:** Benign cardiorespiratory, abdominal and dermatologic exam

Neurological Exam

- Alert & oriented x4
- Cranial nerves II-XII intact
- 4/5 upper extremity strength
- 3/5 lower extremity strength
- Intact rectal tone

- touch
- Intact Finger-to nose and Rapid

Vitals and Labs

Vitals

- **T:** 37.0 C
- **BP:** 126/67
- HR: 108 bpm SpO2: 98% on RA
- **RR:** 20
- Wt: 80kg

Thyroid Markers

- TSH: <**0.100** TSI: **3.07**
- Thyroglobulin ab: **3.6** • FT4: **2.54**
- FT3: **15.9**
- TPO ab: **381**

100
25



stassium Forgives and Heals a Paralyzed Man: A Case of Thyrotoxic Periodic Paralysis



Figure 1. Proposed mechanism for Periodic Paralysis

Intact sensation to light and sharp

Alternating hand movement tests



<u>Site</u>	Pathophysiology	<u>Disease</u>
Spinal cord	Compressive	Traumatic Spinal Injury, Epidural Abscess, Hematoma, Discitis
	Inflammatory	Transverse Myelitis
	Metabolic	Subacute Combined Degeneration (Vitamin B12 deficiency/ Nitrous Oxide poisoning)
Anterior horn cell	Viral	Vaccine-associated Myelitis, Enteroviral Myelitis, Poliomyelitis
	Vascular	Anterior Spinal Artery Infarction
Roots/nerves	Immune mediated	Guillain Barre Syndrome
	Toxin	Porphyria, Arsenic
	Viral	Rabies
	Trauma	Injection-related Sciatic Neuritis
Neuromuscular junction	Immune mediated	Myasthenia Gravis
	Drugs/ Toxins	Organophosphates, Snake Envenomation, Aminoglycosides, Tick paralysis
	Dyselectrolytemia	Hypermagnesemia
Muscle	Infection	Viral Myositis
	Inflammatory	Inflammatory Myopathy (Polymyositis)
	Channelopathy	Periodic Paralysis (Hypokalemic, Thyrotoxic)
	Dyselectrolytemia	Hypokalemia

Table 1. Differential diagnosis of acute paralysis (referenced and modified from Singhi et. al)

Donald Gaines, MD, LT, MC, USN; Tyler Reed, MD, LT, MC, USN; Phylicia Irons, MD, LCDR, MC, USN; Michael Roth, MD Departments of Emergency Medicine, Internal Medicine, Naval Medical Center, Portsmouth, Virginia

Initial imaging negative for acute bony injury or mass effect on XR and CT imaging. Thyroid ultrasound: Diffuse heterogeneity and hyperemia of the thyroid, suggestive of thyroiditis

- Admitted to floor

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Imaging

Clinical Course

 Treated with IV and PO Potassium Chloride Initiated on Beta Blockers and Methimazole

•Had spontaneous recovery of strength several hours later • Remained stable overnight and was discharged next day

Case Discussion

Thyrotoxic periodic paralysis is a rare but concerning complication of hyperthyroidism. It is believed that patients who are at risk of TPP have a loss-offunction mutation in the Kir potassium efflux channel (1,2). This makes patients at risk for becoming hypokalemic if hyperthyroid, hyperandrogenic or

hyperinsulinemic, all of which upregulate Na-K ATPase channels, shifting potassium intracellularly (1,3,4,5,6,7). This creates altered sarcomere action potential, stunting the power-stroke, causing paralysis (1,8,9). Treatment is performed by treating underlying disease and repleting potassium.

References

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