Thyrotoxic Periodic Paralysis in a Caucasian Adolescent Male

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(Authors have no financial relationships to disclose)

HISTORY

A 19-year-old Caucasian male presented with acute onset of bilateral lower extremity weakness. Symptoms began one day prior with difficulty moving his legs or standing after waking from sleep. He denied recent fevers, respiratory symptoms, numbness, paresthesia or myalgia.

PHYSICAL EXAMINATION

On arrival he was found to be hypertensive and tachycardic. Physical examination revealed 1/5 strength in bilateral lower extremities but full strength in upper extremities. His sensation was intact throughout. The remainder of the exam was within normal limits.

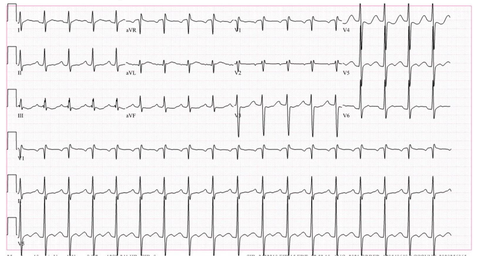
DIAGNOSTIC WORKUP

Hemoglobin	14.3
Hematocrit	42.1
WBC	7.2
Platelets	316

Sodium	139
Potassium	1.9
Bicarbonate	18
Chloride	108
BUN	17
Creatinine	0.53
Calcium	9.0
Magnesium	1.8

ESR 3
CRP < 3.0
Lyme panel negative
Troponin: negative
CK 247

Chest X-ray: unremarkable



PICU Admission

TSH < 0.030 IU/ml, FT4 3.87 ng/dl

Thyroid ultrasound: Enlarged heterogeneous thyroid gland, no nodules

Thyroid-stimulating antibodies 14.40 IU/L

FINAL DIAGNOSIS

- Thyrotoxic periodic paralysis due to Graves' Disease
- Metoprolol for acute thyrotoxicosis management
- Later switched to propranolol and started on daily methimazole prior to discharge
- Awaiting treatment for radioiodine ablation

DISCUSSION

Thyrotoxic periodic paralysis

- Hypokalemia, acute onset of lower extremity weakness, hyperthyroidism
- Mostly found in adult Asian males
- In the past two decades, less than 20 cases in adolescents reported
- Hyperthyroidism → increased tissue responsiveness to beta-adrenergic stimulation → increased sodium-potassium ATPase activity on the skeletal muscle membrane → intracellular potassium shift → hypokalemia, muscle weakness, potential cardiac arrhythmias
- Acute treatment: potassium replacement with cardiac monitoring, beta-blocker
- Definitive management: treating hyperthyroidism