

# A Curious Case of Paralysis

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We present a 32 y/o Polish gentleman who presented following a collapse with preserved consciousness. Preceding this event he was noted to have had a rapid deterioration in mobility with worsening weakness in all four limbs. He was diagnosed with Thyrotoxic Periodic Paralysis and was admitted to the Intensive Care Unit for close observation and central potassium replacement.

## BACKGROUND

- He had a recent diagnosis of hyperthyroidism after displaying symptoms of fatigue, rash, palpitations, nausea and weight loss. He was being treated with propylthiouracil.
- He had nil past medical history/family history and was a non-smoker and non-alcohol drinker. He was usually independent, living with his wife and two children.
- Positive examination findings included tachycardia, upper limb weakness with MRC grading 2/5 power bilaterally and lower limbs weakness with 1/5 power.

## INVESTIGATIONS

TFTS		POTASSIUM	
TSH	<0.03mU/L	DAY 1	3.2
T4	32.5pmol/L		1.8
T3	12.8pmol/L		2.0
		DAY 2	4.2
			3.9
		DAY 3	4.7
			4.2
			4.2

Table 1. TFTs on admission  
Table 2. K+ during admission

- Chest X-ray: Nil focal
- ECG: Sinus tachycardia with global T wave inversion

## DIAGNOSIS?

- He was diagnosed with **Thyrotoxic Periodic Paralysis** and was admitted to the Intensive Care Unit for close observation and central potassium replacement.
- His paralysis improved with treatment and he was discharged with close follow up.

## DISCUSSION

- **Thyrotoxic Periodic Paralysis (TPP)** is an uncommon acquired presentation in the context of hyperthyroidism, usually manifesting as sudden attacks of painless muscle weakness without loss of consciousness.

### More common in..

Males  
Age 20-40  
Asian demographic

- It can occur in any context of hyperthyroidism and due to this, Grave's disease, it's most frequent presentation, is the most common cause.

## WHY?

- It has been postulated that thyroid hormone increases tissue responsiveness to  $\beta$ -adrenergic stimulation, which increases Na-K ATPase activity on skeletal muscle membrane.
- This drives potassium into cells, leading to hyperpolarisation of the muscle membrane and relative inexcitability of the muscle fibres.



**Patients will present with sudden attacks of weakness. Exceptional cases of bulbar weakness and respiratory weakness requiring ventilator support has been reported in TPP**

## TREATMENT

The acute treatment is **replacement of potassium**

- It is important to remember that initially with treatment, potassium often falls. This can also be followed with occasional rebound hyperkalaemia.
- A euthyroid state eliminates further attacks of TPP.

**All patients presenting with marked painless weakness should be assessed for Thyrotoxic Periodic Paralysis**