

## **Society for Endocrinology, Clinical Update 2007**

**Title:** A Case of Severe Thyrotoxic Hypercalcaemia

**Authors:** VKB Prabhakar & PJ Hale

**Institution:** Stepping Hill Hospital, Stockport

Suitable for 'Disorders of Thyroid gland'

A 25-year-old teacher presented acutely unwell with palpitations, breathlessness, nausea and vomiting. 4 years previously, she was treated for Graves' disease with carbimazole for 15 months, and had since remained euthyroid. On examination, she was tachycardic but normotensive, tachypnoeic, had tremors of out-stretched hands, retraction of eyelids, and moderate sized smooth diffuse goitre with bruit. Initial blood tests revealed hyperthyroidism together with hypercalcaemia - the maximum measured corrected calcium level being 3.36 mmol/L (normal range: 2.08 – 2.49 mmol/L), raised phosphate 1.87 mmol/L (range: 0.75 – 1.55 mmol/L) and alkaline phosphatase 135 U/L (range: 35 – 125 U/L). Renal function was normal. She was treated with intravenous fluids, intravenous anti-emetics, carbimazole 60 mg/day and propranolol 160 mg/day. Further investigations included positive TSH – receptor antibodies at 17.8 u/L (range: 0 -1 u/L), suppressed parathyroid hormone 3.0 pg/mL (range: 11 – 65 pg/mL), hypercalciuria 13.83-mmol/24 hr (range: < 7.5 mmol/24 hr), normal chest x-ray and negative myeloma screen. The metabolic abnormalities resolved after being rendered euthyroid.

Significant hypercalcaemia related to thyrotoxicosis alone is rare while milder elevations of serum calcium are well documented. However, the pathophysiology is not fully understood. Reduced intestinal calcium absorption, enhanced urinary and faecal calcium excretion, accelerated bone turnover and negative calcium balance seen in hyperthyroidism, all point towards bone as being the source of hypercalcaemia. A direct stimulatory effect of increased thyroid hormones on bone cells is the commonly proposed causative mechanism for hypercalcaemia; catecholamines'-induced bone resorption may also play a role. A combination of anti-thyroid medication and beta-adrenergic blockade was effective in our patient. The degree of thyrotoxic hypercalcaemia observed is possibly one of the highest identified in the contemporary literature.

