Clinical and biochemical suspicion of pheochromocytoma due to fluctuating thyroid tests in a patient with medullary thyroid cancer

CH Hariman, L Pelluri, S Sankar, MO Weickert
University Hospitals Coventry & Warwickshire, Coventry, UK

Abstract

Introduction: Pheochromocytoma is a rare and potentially life threatening disease. It can present with non specific symptoms of palpitations, headache and hypertension. Such symptoms in a patient with background of previous medullary thyroid carcinoma cannot be ignored and would warrant further investigation for possible MEN II.

Case report: A 45 year old gentleman presented with table hypertension, palpitations and palpitations. He had a history of recurrent medullary thyroid carcinoma with previous total thyroidectomy and external beam radiotherapy. He has been on a relatively high replacement dose of 225 micrograms of T4-Thyroxine but initially showed a higher normal TSH of 4.32 mU/L, indicating that the dose was adequate. Pheochromocytoma was suspected and investigated given the persistent symptoms. Three separate collections of urinary catecholamines showed mildly elevated levels of free noradrenaline between 225-365 nmol/mmol creatinine. Genetic testing confirmed RET exon 11 as negative. Nucleotide imaging did not support presence of a pheochromocytoma or paraganglioma. The patient’s thyron function tests were repeated and showed over replacement with suppressed TSH and normal FT4, despite unchanged replacement doses. Levothyroxine replacement was reduced to 175 micrograms to achieve a euthyroid biochemical state. Both his symptoms and urinary catecholamines returned to normal.

Conclusion: The patient’s laboratory tests and imaging findings do not support the diagnosis of pheochromocytoma. The decreased Levothyroxine dose may have contributed to the normalization of the patient’s symptoms.

Table 1

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<th>Date</th>
<th>Urine Volume</th>
<th>Total T4</th>
<th>Free T4</th>
<th>Total T3</th>
<th>Free T3</th>
<th>TSH</th>
<th>FT4</th>
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Table 2

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Literature review

Thyroid and catecholamine homeostasis

Thyroid and catecholamine homeostasis may be closely interlinked (1)(2). Thyrotoxic patients, regardless of the cause, can display similar clinical presentation to patients with intermittent catecholamine excess such as Pheochromocytoma.

Thyroid hormones correlate and interact with levels of urinary/plasma catecholamines (3)(4)(5)(6). However, in our presented case, his initial thyroid function tests were normal. This was likely related to impaired and fluctuating absorption of Levothyroxine, which was initially ingested alongside food. Most notably, many foods which are typically consumed at breakfast, such as coffee, fruit juices and cereal fibres have been shown to affect the absorption of Levothyroxine. (7)(8)(9)(10).

Interruption thyroid absorption

Three possible causes of false positive urinary tests

Although this gentleman was unlikely to have a Pheochromocytoma following his MIBG and Octreotide scan, there may be other causes of his falsely elevated urinary catecholamines. Certain commonly used drugs such as B-complex vitamins, erythromycin antibiotics, calcium, statins, clonidine, diltiazem, and methadone, beta-blockers, and calcium channel blockers may cause an increased level of fractionated urinary metanephrines and free catecholamines by fluorescent interference (15)(16).

The use of amantadine, and the newer antipsychotic Aripiprazole or a combination of the two medication has also been associated with false-positive elevation of urinary catecholamines(17).

References