

The iatrogenic thyroid disease treatment

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Many factors may affect the level of thyroid hormones and thyrotropin. In treating patients, various consideration including the clinical status of the patient and possible confounding factors such as infection and age needs to be considered before starting treatment for either thyrotoxicosis or hypothyroidism.

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INTRODUCTION

Diagnosis of thyroid diseases is often challenging with various manifestations that are non-specific such as lethargy, weight gain or loss, palpitations or weakness. A key factor in the diagnosis of thyroid disease such as hypothyroidism or hyperthyroidism, is accurate interpretation of thyroid hormone (TH i.e. T4, thyroxine; T3, triiodothyronine) and thyrotropin (TSH) concentrations that are commonly measured in a test called thyroid function test (TFT).¹ In a subgroup of patients, the interpretation of TFT is more challenging, either because the results appear to not correlate with the clinical picture i.e. a low TSH in patient with hypothyroid or normal TFT in patients is suspected to be strongly thyrotoxic.¹⁻² In these patients, a structured approach that includes clinical reassessment of thyroid status, along with various potentiating factors [e.g. infection, stress, drug therapy] can help in identifying the possible solution to this discordant TFT. A referral to an endocrinologist is also warranted in certain cases. This is a case that correctly depicts the pitfall in the diagnosis and management of this condition.

CASE REPORT

A 70-years old man presented with weakness for two days to the neurologist. This has been a recurrent problem for the past two years. It typically occurs in clusters of a few days.

The patient has a background history of hypertension, diabetes and hypothyroidism. Both hypertension and diabetes were diagnosed about 10 years ago. His hypothyroid condition was diagnosed two years ago based on a low T4 and correspondingly high TSH at a primary care clinic.

His current medication is amlodipine 10mg daily, metformin 500mg daily and L-thyroxine 50 microgram. He was previously on L-thyroxine

75microgram which was adjusted based on a very low TSH level (<0.01 pmol/L).

He has seen many physicians over this past two years, but his underlying weakness is not improving. In fact, he has also been investigated for weight loss of 10kg over the past 2 years with various imaging methods and blood tumour markers, but without any positive lead.

On examination, he looks cachexic. He has mild pallor but otherwise has normal vital signs. His physical examination is also unremarkable including his physical examination. His latest HbA1c is 6.3%.

A list of investigation was ordered of which the most striking case was the TFT result. While the T4 results was within the normal range, TSH was 0.1. The thyroxine medication was stopped temporarily.

He was seen six week later. His TFT level recovered to normal. His weakness also improved on which he was very grateful to the treating physician. He gained 2 kg over this period of time. The neurologist attributed his symptoms as side effects due to iatrogenic thyroxin therapy. On further questioning, it was noted his thyroxine was started two years ago while he was having some upper respiratory illness.

DISCUSSION

A small but significant number of patients may reveal TFT results that doesn't correlate with their clinical status. In such scenarios, a careful search for confounding factors [e.g. physiological changes of age, pregnancy, intercurrent (non-thyroidal) illness or concomitant medication use] is required before jumping into further assessment is essential to avoid unnecessary waste and risk in unneeded investigation and treatment.² In particular, they may be a reduced physiological production of thyroid hormones and concurrent rise in TSH secondary to

age which may not need treatment as noted in this case.²

Thyroid antibodies such as TPO-Ab and TRAb may help in diagnosis but not in all cases. In patients with Hashimoto's thyroiditis, TPO-Ab is nearly always elevated.³ TRAb on the other hand helps in the differential diagnosis of hyperthyroidism.⁴ Only in very rare instances, acquired and genetic causes of discordant TFTs can be considered such as investigating for resistance to thyroid hormone and

disorders of thyroid hormone transport or metabolism.^{1,5} Looking ahead, the increasing availability of next generation sequencing will likely expand the reporting of genetic causes and disorders of TH transport, action and metabolism.²

The following (table 1) may help in delineating the cause of abnormal thyroid hormone levels but correlation with clinical condition is equally as important before a final diagnosis is reached.⁶

Table 1: Guide to thyroid hormone interpretation

Thyroid Function Test Interpretation			
TSH	Free T4	Free T3	Condition
Normal	Normal	Normal	• None
Low	High	High	• Hyperthyroidism
Low	Normal	Normal	• Subclinical Hyperthyroidism
Low	Normal	High	• T3 toxicosis
Low	High	Normal	• Thyroiditis • T4 ingestion • Hyperthyroidism in the elderly or with comorbid illness
Low	Low	Low	• Euthyroid sick syndrome • Central hypothyroidism
High	Normal	Normal	• Subclinical Hypothyroidism • Recovery from euthyroid sick syndrome
High	Low	Low	• Primary hypothyroidism
High	High	High	• TSH producing pituitary adenoma

CONCLUSION

In conclusion, the treatment of thyroid disease may need more than just consideration of thyroid hormone levels to avoid any iatrogenic effect such as extreme weight loss and weakness.

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