Delayed diagnosis of severe secondary hypothyroidism in a patient presenting with mixed hyperlipidaemia and a metabolic myositis

Authors: Dr James MacFarlane (CMT 2), Dr James Clark (Consultant Endocrinologist)
Department of Diabetes and Endocrinology, East Surrey Hospital; Surrey and Sussex Healthcare NHS Trust

Presenting complaint

A 51 year old South Asian woman was referred by her GP to the outpatient endocrine clinic with diffuse musculoskeletal pains in her lower limbs, lethargy and weight gain in the context of a previous hemithyroidectomy.

Past medical history

1) Right hemithyroidectomy
   (for histologically benign thyroid nodule)
2) Obesity – BMI 33.3
3) Hypercholesterolaemia
4) Hyperthyroidism

Drug history

1) Ferrous Fumarate 210mg TDS
2) Non-smoker
3) Minimal ETOH consumption
4) NKDA

Family history

Father – CVA in his 50s
Mother – Deceased; complications of TB
Sister – T2DM
Brother – HTN / hypercholesterolaemia

Social history

Works in customer services
2 school-age children

Further history of presenting complaint

Further history revealed intermittent pains in both lower limbs for several months; primarily left knee and right ankle. This was associated with 5kg of unintentional weight gain.

The patient also had a new diagnosis with hypercholesterolaemia from her GP 9 months ago that was being managed with lifestyle interventions in the first instance. She reported feeling increasingly lethargic for many months but this hasn’t affected her ability to undertake her job or activities of daily living.

Initial biochemistry

TSH 3.21 [0.4 – 4.5 mU/L]
Creatinine Kinase 1950 [24 – 170 U/L]
Total cholesterol 9.5 [<5.5 mmol/L], LDL 6.5 [<3 mmol/L], HDL 1.40 [<1.0 mmol/L], Triglyceride 3.5 [<1.7 mmol/L]
Hb 106g/L, MCV 86 IL, Ferritin 60 mg/L
B12, Folate, Vitamin D, U&Es, LFTs - Normal

Initial review

BP 113/73mmHg, weight 74.9kg, height 1.50, BMI 33.3
Clinical examination: right hemithyroidectomy scar, no goitre. Diffuse muscular tenderness, no signs of synovitis.
Referred to Rheumatology clinic for investigation of elevated CK (who planned an EMG and muscle biopsy).
For annual follow-up in endocrine clinic.

Interval biochemistry

TSH 2.59 [0.4 – 4.5 mU/L], Free T4 1.7 pmol/L [9 – 25]
Free T3 1.3 pmol/L [3.5 – 7.8] U&Es normal, Lipid Profile unchanged, Glucose 5.4

Further work-up – pituitary profile and history

Has had two children, breastfed on both occasions (9 months, 3 months).
No issues with postpartum haemorrhage.
No problems with milk supply.
No history of head injury.
Period stopped – 40 years old.
Short Synathen Test: Baseline 145nmol L, [170], 30 mins: 416nmol/L, 60 mins 525nmol/L [580]
IGF-1 2.4 nmol/L [6.2 – 26.3], Prolactin 9 mU/L [40 – 530]
FSH 3.4 IU/L [23 – 116], LH 1.4 IU/L [17 – 75]

Diagnosis and management

Diagnosis: Panhypopituitarism with a metabolic myositis and dyslipidaemia

Commenced on thyroid hormone replacement which was subsequently uptitrated to 100 micrograms per day and hydrocortisone replacement therapy (10mg, 5mg, 5mg).

Over the following 9-12 months there was almost a complete resolution of the metabolic myositis and dyslipidaemia as shown on the graphs below.

Subsequently, the patient experienced exertional chest pains prompting a cardiology referral. Work-up has revealed stenosis within the LAD awaiting percutaneous intervention.

TSH and T4 – paired testing

Hypothyroid myositis

Hypothyroidism has been shown to accelerate plaque mobilisation and degradation.

Dyslipidaemia is a common abnormality in patients with thyroid disease. It is the end result of thyroid hormones playing a role in multiple aspects of lipid metabolism including synthesis, mobilisation and degradation.

The most common pattern of lipid abnormalities seen in overt hypothyroidism is an increase in total cholesterol and in LDL-cholesterol. Triglycerides, HDL-cholesterol and lipoprotein may either be normal or mildly elevated. The case presented here is in-keeping with the literature.

Patients with overt hypothyroidism are at significantly increased risk of cardiovascular disease. Due to the wide-ranging effects of thyroid hormones this is multifactorial. Hypothyroidism has been shown to accelerate plaque development, directly impair left ventricular function and increase total peripheral resistance. The effect of atherosclerosis is independent of the effect on lipid profile. There is little in the literature to quantify the increased risk of overt hypothyroidism on cardiovascular outcomes. However, meta-analyses of cohort studies have shown sub-clinical hypothyroidism appears to confer a relative risk of 1.21 for all-cause cardiovascular mortality in those aged >65. [5]

The risk from overt hypothyroidism is likely even greater. I suspect hypothyroidism played a significant role in the development of this patient’s early ischaemic heart disease given that she has few other conventional risk factors.

References: