Peterborough and Stamford Hospitals
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If it feels like Myxoedema Coma, then it probably is!

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Introduction

Myxoedema coma (hypothyroid crisis) is an endocrine emergency where patients are in a severe hypothyroid state. It is a life-threatening and potentially reversible condition, but can be difficult to recognise due to the varied symptomatology. Elderly female patients are at highest risk and infective illnesses and septicaemia are the main precipitants.[1] The mainstay of treatment is intravenous administration of thyroid hormones (L-Tri-iodothyronine) and supportive treatment. Despite our immense understanding of this emergency, hypothyroid crisis remains widely under-appreciated.

Hypothyroid crisis occurring in the presence of mildly abnormal thyroid function test (TFT) results is a rare but recognised phenomenon.[2]

Case

An 82 year-old lady was admitted to hospital with a simple urinary tract infection with a surprisingly poor response to therapy. She has hypothyroidism secondary to a thyroidectomy 8 years ago usually well-controlled on oral levothyroxine 50 mcg daily and chronic mild hyponatraemia due to inappropriate anti-diuretic hormone secretion (with previously normal adrenal function). Her condition worsened rapidly with clinical features suggestive of sepsis. Despite fluid resuscitation and antibiotics, she became unconsciousness with hypotension, relative bradycardia, hypothermia, hypoxaemia: clinical features suggestive of a severe hypothyroid crisis.

Investigations and Treatment

Her biochemical test results are shown in the Table 1. Despite mildly hypothyroid TFT results, but features suggesting hypothyroid crisis, she was given a trial of intravenous L-Tri-iodothyronine (T_3) at a dose of 50 mcg initially followed by 25mcg 8 hourly.[3] She was also given intravenous steroids. She showed a striking clinical response just after two doses: in fact after the first dose she gained full consciousness within 4 hours.

Table 1

Test	Results	Normal values
Thyroid stimulating hormone, TSH (mU/L)	6.37	0.3-4.2
Free T_3 (pmol/L)	3.2	3.1-6.8
Free T_4 (pmol/L)	21.5	12.0-22.0
Random Cortisol (nmol/L)	311	Done 2 days after admission
Random Glucose (mmol/L)	7.1	<7.0
Haemoglobin (g/dL)	12.9	115-165
Platelets (10^9/L)	140	150-400
White cell count (10^9/L)	6.7	4.0-11.0
C-reactive protein (mg/L)	12	<10
Troponin-T (ng/L)	14	<14
Sodium (mmol/L)	120	133-146
Potassium (mmol/L)	3.7	3.5-5.3
Chloride (mmol/L)	87	95-108
Adjusted Calcium (mmol/L)	2.19	2.2-2.6
Creatinine (µmol/L)	88	50-120
Urea (mmol/L)	6.0	2.5-7.8
eGFR (mL/min)	53	>60
Amylase (U/L)	43	0-100
Coagulation (INR)	0.90	0.8-1.25
Lactate (mmol/L)	2.20	0.6-2.5

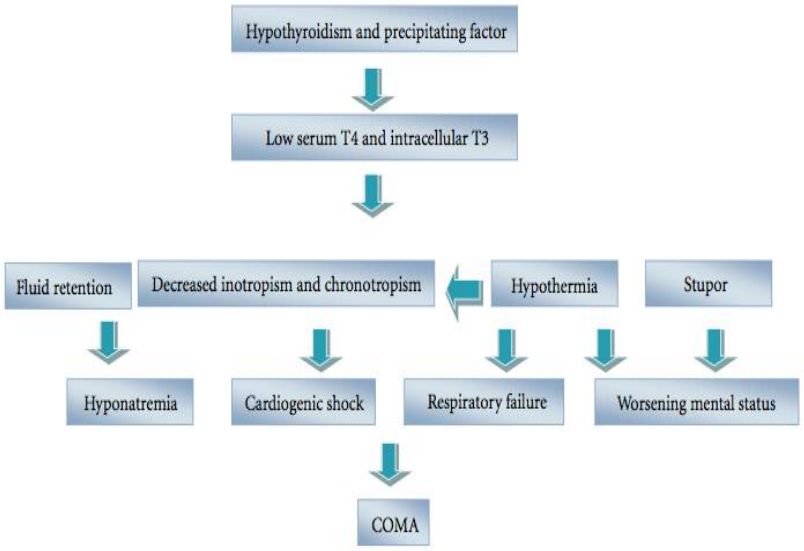

Figure 2 - Pathogenesis of myxoedema coma adapted from Mathew et al[1]

- Intracellular deficiency of T3 in the presence of mild hypothyroidism can be exacerbated by the increased metabolic demand of infections and septicaemia.
- This patient's TSH levels have always been below 2.5mU/l until her admission when it was 6.37mU/l.
- One should always be aware of the probability of co-existing adrenal crisis.

Conclusion

Our patient was soon discharged, remains well and is under regular follow-up. This case emphasises the potential reversibility of this life-threatening emergency. A low index of clinical suspicion amidst multiple co-morbidities and sepsis is required, even in the face of near normal or mildly hypothyroid TFT results.

References

1. Mathew V, Misgar RA, Ghosh S, et al. Myxoedema Coma: A New Look into an Old Crisis. J Thyroid Research 2011; ID 493462
2. Mallipedhi A, Vali H, Okosieme O. Myxedema coma in a patient with subclinical hypothyroidism. Thyroid 2011; 21(1): 87-9.
3. British National Formulary, March 2015.