

Introduction

Myxoedema coma is an uncommon life threatening endocrine crisis usually occurring in the elderly women. It is often precipitated by an acute event such as infection, myocardial infarction, cold exposure, administration of sedative drugs or inappropriate withdrawal of thyroid medication. Although the condition is rare nowadays, it is important to recognise because of high associated mortality.

Case Presentation

64 year old woman with history of

- Autoimmune hypothyroidism on 50 µg levothyroxine
- Primary hyperparathyroidism
- Bipolar disorder since age 18 yrs
- Sectioned under mental health act at a mental health institute
- On antipsychotics and sedatives including procyclidine, haloperidol and benzodiazepines
- Non compliant with her medication
- On intravenous antibiotics for cellulitis

She was admitted to hospital in September 2013 with confusion, stupor, hypothermia (T-29C), hypotension (SBP<60mmHg), bradycardia (HR-38 bpm) and respiratory depression.

On admission she was severely hypothyroid with TSH of 320mIU/L, T4 of 5.4pmol/l and T3 of 1.5pmol/l. There was no overt sepsis as evidenced by normal lactate, inflammatory markers and CXR. Myxoedema crisis was suspected and she was admitted to ITU for further management.

Investigations

Blood	Values	Reference
Hb	103g/l	115-165
MCV	98.4fL	80-99
Neut	7.8x10 ⁹ /l	2-7.5
CRP	8 mg/l	0-5
Na	141mmol/l	134-146
K	4.2mmol/l	3.4-5.2
Urea	14.4mmol/l	3.4-8
Creat	147 µmol/l	50-111
GFR	31ml/min	>90
Random Cortisol	419nmol/l	79-478

ABG on air	
Ph	7.343
PCO2	8.23
HCO3	28.9
BE	5.9
PO2	6.30
SaO2	77%
Lactate	1
Glucose	6

ECG-Sinus bradycardia (rate 38/min), left axis deviation
Chest X-ray- no consolidation or cardiomegaly

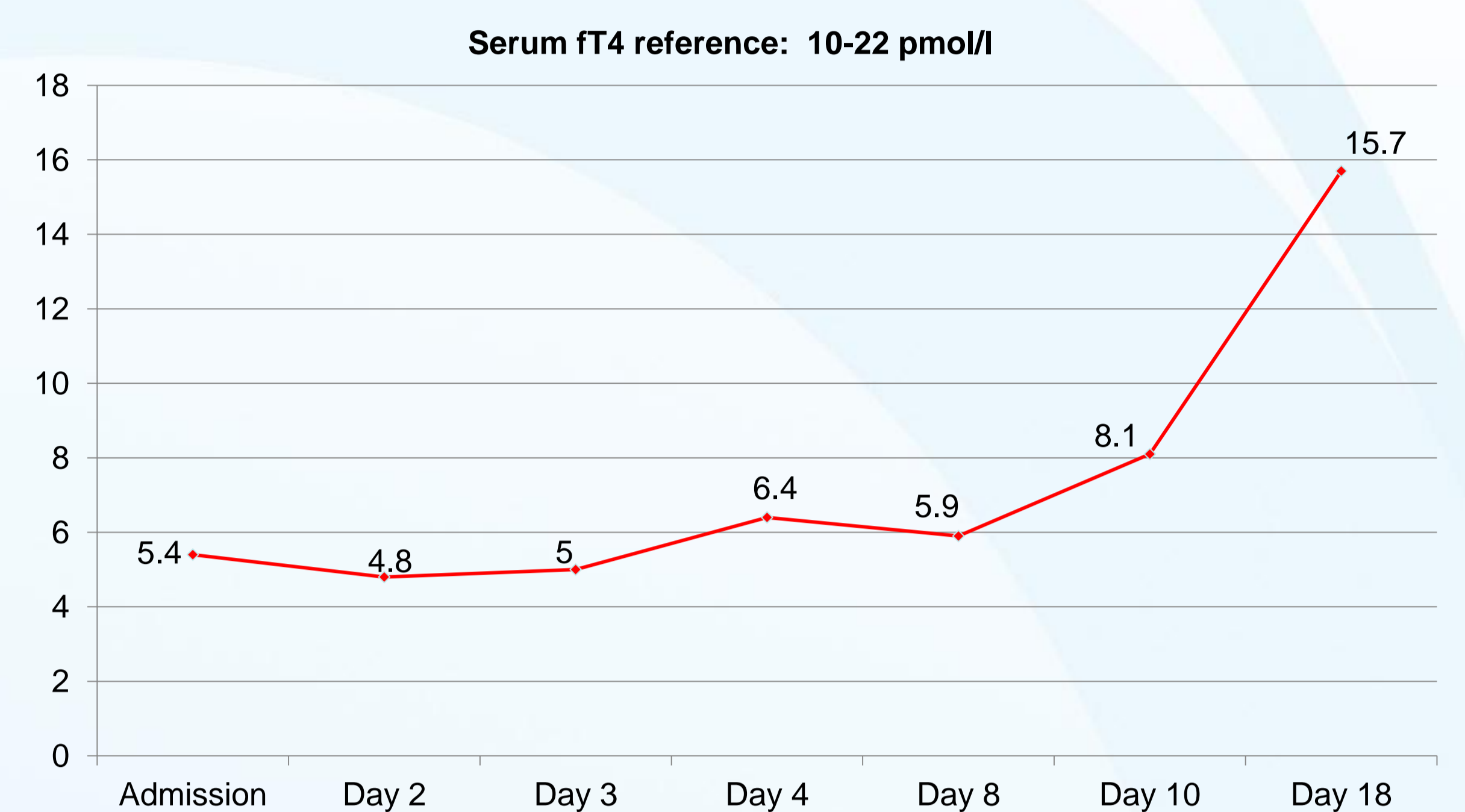
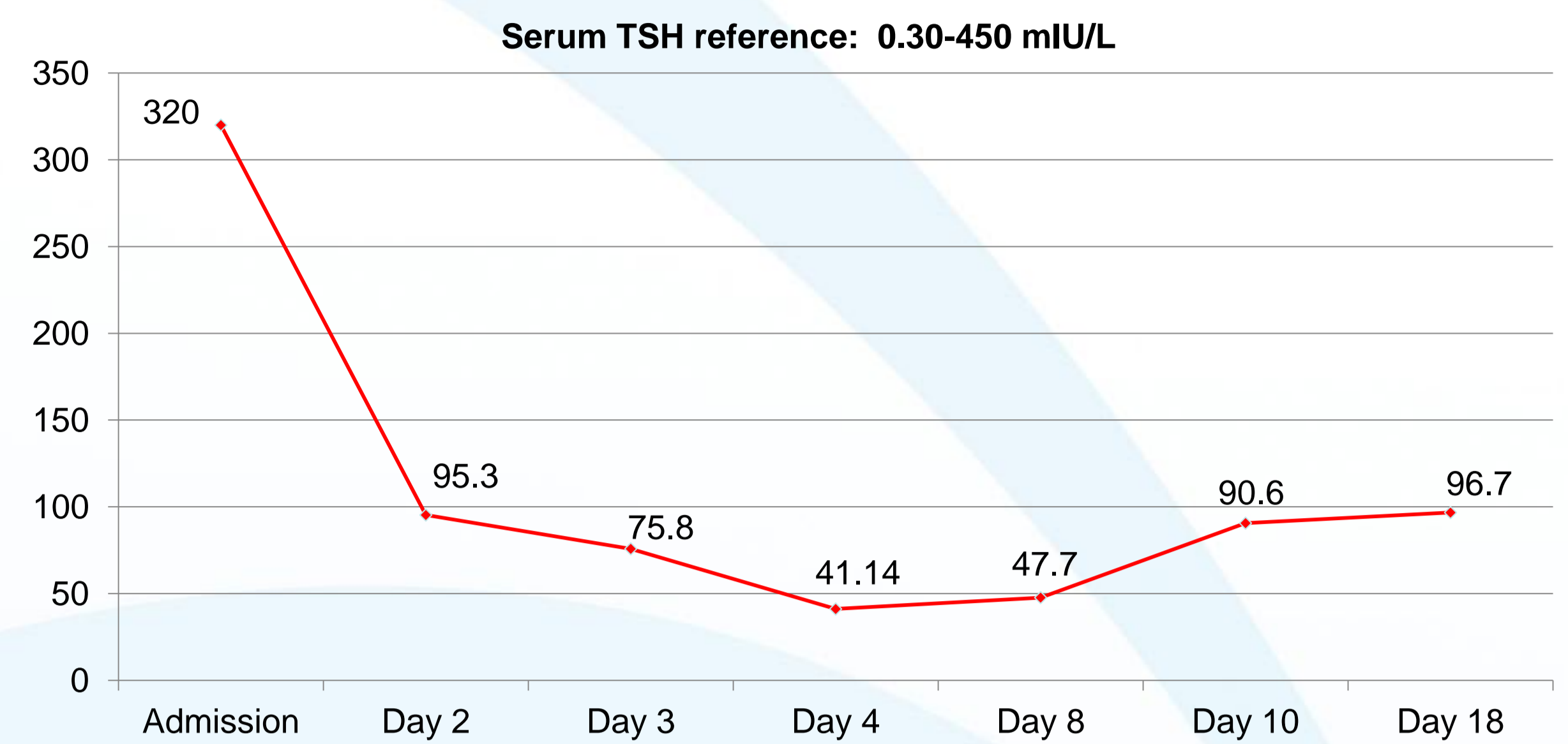
Management

- Fluid resuscitation
- Inotropic support for 24 hours
- Hydrocortisone 100 mg 6 hourly
- Liothyronine 50 µg intravenous followed by 25 µg TDS
- Levothyroxine 100 µg oral OD was commenced on day 3
- Liothyronine was tapered and stopped on day 5
- Intravenous flucloxacillin for cellulitis

References

- Kwaku MP, Burman KD. Myxedema Coma. Journal of Intensive care medicine. 2007;22(4)
Leonard Wartofsky. Myxedema Coma. Endocrinol Metab Clin North Am. 2006;35(4)
Yamamoto T *et al.* Factors associated with mortality of Myxedema coma: report of eight cases and Literature Survey. Thyroid. 1999;9(12)

Progress



On day 10 serum TSH started rising as patient was again non compliant with her medications. She was commenced on levothyroxine 700 µg once a week and transferred back to the Psychiatric unit. Her mental health improved following Electro Convulsive Therapy and she was discharged on levothyroxine 100 µg OD.

Discussion

Patients with Myxoedema coma will need treatment with hydrocortisone not only because of the possibility of coexistent primary or secondary adrenal insufficiency but also because of the possibility that thyroid hormone therapy may increase cortisol clearance and precipitate adrenal insufficiency. It is usually given as 50-100 mg intravenously every 6-8 hours for several days depending upon clinical response and further diagnostic evaluation.

Controversy remains whether to administer T3 or T4 and the dosing regimen to restore thyroid hormone concentrations to normal safely. T4 therapy may provide a steadier and smoother but slower onset of action with lower risk of adverse effects. T3 onset of action is considerably more rapid than that of T4 but FT3 serum concentration fluctuates more between doses. Serum TSH response to T3 is more rapid than T4, however cardiac complications may be increased especially in the elderly.

Review of literature shows that advanced age, high initial dose of either T3(>75 µg iv) or T4(>500 µg iv) therapy and cardiac complications were associated with increased mortality. Controlled T4 monotherapy or in combination with T3 may be effective in reversing myxoedema coma safely.

The most challenging aspect of managing patients with mental illness and myxoedema coma is not only early diagnosis and reversing severe hypothyroidism but also a more definitive treatment of their mental illness.