PP-T-11

CARDIAC TAMPONADE IN MYXEDEMA CRISIS – AN UNCOMMON PRESENTATION OF A RARE ENDOCRINE EMERGENCY

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BACKGROUND

Myxedema crisis is a state of severe hyperthyroidism with end-organ decompensation. Pericardial effusion is an uncommon manifestation of hypothyroidism. As large effusions are rare and typically accumulate slowly, cardiac tamponade rarely occurs. We present a rare case of cardiac tamponade from a large pericardial effusion in a patient with myxedema crisis.

CASE

Our patient was referred to our Endocrinology service for evaluation of severe hypothyroidism. A diagnosis of myxedema crisis was made due to the presence of biochemically-proven severe hypothyroidism {fT4 2.0 pmol/L [normal range (NR) 8-16], fT3 <2 pmol/L (NR 3.5-6), and TSH 82.27 mIU/L (NR 0.45-4.5)}, with features of end-organ decompensation (congestive heart failure, hypotension, bradycardia, and altered mental status). Transthoracic echocardiography revealed a large pericardial effusion with small ventricular size and reduced tricuspid inflow velocity suggestive of a partially compensated tamponade.

The patient received an intravenous thyroxine loading dose of 200 mcg followed by 100mcg daily maintenance doses. Despite improvement of the manifestations of hypothyroidism and normalisation of serum thyroxine levels, she remained persistently hypoxemic and could not be weaned from supplemental oxygen.

Hence, bedside pericardiocentesis was performed with diagnostic and therapeutic intent. Pericardial fluid analysis did not reveal any secondary cause. She demonstrated good clinical improvement post-pericardiocentesis and was eventually discharged.

CONCLUSION

Cardiac tamponade is a life-threatening severe manifestation of myxedema crisis. As pericardiocentesis may be lifesaving, we recommend screening for cardiac tamponade in patients with myxedema crisis who demonstrate poor cardiorespiratory improvement despite adequate thyroid hormone therapy.

PP-T-12

RE-ASSESSMENT OF THE TSH-FREE T4 RELATIONSHIP WITH ELECTROCHEMILUMINESCENCE ASSAY

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OBJECTIVES

In the initial assessment of thyroid function, Thyroid Stimulating Hormone (TSH) is often employed first followed by free T4 (fT4), since small changes in fT4 are accompanied by a much larger change in TSH from the time 3rd-generation TSH assays were introduced in 1990. This inverse TSH-fT4 log-linear relationship has been confirmed with many different assays. Roche Diagnostics, a popular automated immunoassay platform based on electrochemiluminescence, improved the sensitivity of their TSH assay from 0.01 to 0.005 mIU/L in late 2020. We studied the TSH-fT4 relationship with the new Roche assay on their Cobas e601 analyzer.

METHODOLOGY

All samples received from the primary health clinics with requests for both TSH and fT4 in 2021 were retrieved from the Laboratory Information System. Children (<18yo) and pregnant subjects were excluded. Where patients had repeat testing, only the earliest results were included to ensure that the thyroid tests were probably at their stable state. The assay measuring ranges are as follows: TSH 0.005-100 mIU/L and fT4 0.5-100 pmol/L. Statistical analyses were performed using MedCalc Statistical Software v20.106 (Ostend, Belgium).

RESULTS

11369 subjects (Male = 2465, Female = 8904) aged 18-95 years (mean 48.8 ± 17.4) were studied. Excluding TSH values <0.005 and >100 mIU/L from the calculations (n=633), a significant inverse TSH-fT4 log-linear relationship was seen on regression analysis (log TSH = 1.104 - 0.0534 fT4; r = 0.38; p<0.001); TSH 0.006-99.9 mIU/L, fT4 0.88-100 pmol/L.

CONCLUSION

The assay is sensitive to changes in circulating fT4 and affirms the utility of TSH in thyroid function testing.