Myocarditis is a rare presentation of Graves’ disease, fulminant myocarditis is even rarer. We report a woman with Graves’ disease with fulminant myopericarditis as the presenting clinical feature. A 23-year-old healthy woman presented with acute onset pleuritic chest pain, palpitations, diaphoresis, heat intolerance, and dyspnea. There was no history of fever, upper respiratory tract infection, diarrhea, or weight loss. Physical exam revealed sinus tachycardia and palpable non-tender thyroid. Blood work was pertinent for TSH <0.01uIU/ml(0.3-4.5), free T4 2.8ng/dl(0.6-1.5), free T3 > 32.6pg/ml (2.4-4.2) and positive TSI (thyroid-stimulating immunoglobulin) 12.4 IU/L (<0.54). She had a diffusely enlarged vascular thyroid on ultrasound, all findings consistent with hyperthyroidism due to Graves’ disease. Electrocardiogram showed sinus tachycardia with diffuse PR depression and ST-segment elevation, troponin was 0.85 which increased to 17.5 within 12 hours, an echocardiogram showed normal ejection fraction (EF) with mild pulmonary hypertension but no pericardial effusion. She improved symptomatically with beta-blockers, methimazole, and colchicine but unfortunately had a witnessed ventricular fibrillation cardiac arrest in the next 12 hours with return to spontaneous circulation achieved after 90 minutes of bystander cardiopulmonary resuscitation. Coronary angiogram revealed normal coronaries with post-cardiac arrest EF of 5%. She subsequently developed acute respiratory distress syndrome secondary to massive pulmonary hemorrhage requiring extracorporeal mechanical support for worsening cardiogenic shock, succumbing to her illness a few hours later. Graves’ disease affects 0.5% of the population and causes hyperthyroidism in 50-80% of cases. Thyrotoxicosis may be associated with supraventricular arrhythmias and cardiomyopathy due to long-standing untreated hyperdynamic heart failure, but myopericarditis is an unusual presentation of Graves’ thyrotoxicosis with fulminant myopericarditis being even rarer. Fulminant myocardiitis can present with ventricular tachyarrhythmias and can rapidly deteriorate into shock which may be difficult to distinguish from other causes of cardiogenic shock such as acute coronary syndromes or stress-induced cardiomyopathy. Myopericarditis associated with Graves’ is thought to be due to autoimmunity against functional TSH receptors identified in human cardiomyocytes. Fulminant myocardiitis is a common cause of sudden cardiac death in young healthy adults, which is also the same population that gets Graves’ disease. It is critical to recognize the unusual presenting features of Graves’ disease such as fulminant myopericarditis, as timely aggressive intervention can reduce the risk of sudden cardiac death.

Thyroid

THYROID DISORDERS CASE REPORT

Hashimoto’s Thyroiditis Presenting With Hoffman’s Syndrome in a Patient With the Coronavirus Disease 2019 (COVID 19): Hormone Replacement in the Time of the Pandemic

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Introduction: Hoffmann’s syndrome is a very rare and reversible manifestation of hypothyroidism presenting as

Thyroid

THYROID DISORDERS CASE REPORT

Hashimoto’s Thyroiditis Associated Thyroid Eye Disease: A Success Story of Teprotumumab.

Issra Jamal, MD

Background: Thyroid-associated eye disease is more common in patients with Graves’ disease. However, patients with Hashimoto’s may also be affected by thyroid-associated eye disease in up to 6% of patients. Clinical Case: 44 year old female patient with history of Hashimoto’s thyroiditis presented to the clinic for her hypothyroidism and evaluation of thyroid eye disease. The patient was experiencing episodes of bilateral and unilateral inflammation of her eyes described as redness, dryness, bulging of the eyes. She was evaluated by ophthalmology and was diagnosed with thyroid eye disease and was prescribed a course of steroids with partial improvement of the symptoms. Orbital MRI was ordered and it showed symmetrical enlargement of the inferior rectus muscles bilaterally with the left being slightly more enlarged than the right, retro orbital fat pad was grossly inflamed. TPO was elevated, TSI and TRAb were negative. Patient continued to have frequent flare ups with suboptimal response to steroid therapy. A discussion about starting Teprotumumab was made due to lack of optimal response to steroids and worsening of her symptoms and therapy was started. Patient did develop significant hyperglycemia, but she did not have recurrent flare ups. Studies have found that Thyroid-associated eye disease was present in up to (6%) of Hashimoto’s thyroiditis patients, those with thyroid-associated eye disease tended to be older, have a longer duration of Hashimoto’s thyroiditis, heavy smokers, and were less likely to present with another associated autoimmune disease. TSAb was positive in 5.5% in the patients with Hashimoto’s and thyroid-associated eye disease. Teprotumumab ([IGF-1] receptor inhibitor) was approved for the treatment of Graves’ orbitopathy by the (FDA) in 2020. Conclusion: Hashimoto’s thyroiditis associated thyroid eye disease is a rare clinical presentation. Teprotumumab is a new FDA approved treatment for thyroid eye disease that was successful in treating the symptoms and prevented flare ups in this patient. Careful monitoring of side effects is recommended.

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A 72-year-old man was referred for evaluation of a low TSH. He had a long history of hypothyroidism, euthyroid on levothyroxine, and was diagnosed with cutaneous T cell lymphoma (CTCL). Due to disease progression on dapsone, PUVA and TAR baths, he was started on bexarotene. Soon after, he developed recurrent symptoms of hypothyroidism including fatigue, cold intolerance, dry skin, and myalgias. Workup revealed a TSH of <0.01 ulU/ml (0.27-4.20) with a free T4 of 0.6 ng/dl (0.9-1.7). After evaluation, his levothyroxine dose was increased. Repeat labs 3 months later showed a TSH of <0.01 with a free T4 0.8 ng/dl and T3 43 ng/dl (80-200). Over several months, levothyroxine titration to a supraphysiologic dose of 800 mcg daily was required, despite optimal administration, to normalize FT4. Given persistent hypothyroid symptoms and a low T3 level, liothyronine 5 mcg BID was added and resulted in clinical and biochemical euthyroidism. **Clinical Lessons:** Unlike in primary thyroid disorders, the TSH assay is unreliable in central hypothyroidism since values can be low, normal, or even mildly elevated; regardless, TSH has subnormal bioactivity. Inefficual TSH leads to a low T4, which is a required for diagnosis. Bexarotene, a derivative of Vitamin A, is a retinoid X receptor (RXR) selective ligand approved for the treatment of CTCL. The exact mechanism of bexarotene-induced thyroid dysfunction is not clear, although it involves both central and peripheral effects. Bexarotene inhibits TSH gene expression by decreasing the activity of the thyrotropin β subunit gene promoter in a dose-dependent and thyroxine-independent manner; TSH levels drop as early as 4-8 hours after exposure. Bexarotene also directly lowers T4 and T3 levels, even in athyreotic patients, by negatively impacting deiodinase activity and hepatic conjugation. Stopping bexarotene is often not possible given its effectiveness in CTCL. Therefore, thyroid hormone should be initiated with the goal of achieving a normal FT4, although as the current case demonstrates, massively supraphysiologic doses and/or the addition of liothyronine may be necessary to achieve clinical euthyroidism.

**Thyroid**

**THYROID DISORDERS CASE REPORT**

**High-Dose Thyroid Hormone Replacement in Bexarotene-Induced Central Hypothyroidism.**

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**Background:** Central hypothyroidism is a rare disorder characterized by a defect in thyroid hormone production by an otherwise normal thyroid gland due to decreased stimulation by TSH. Medications are an uncommon cause.

**Case Presentation:** A 72-year-old man was referred for evaluation of a low TSH. He had a long history of hypothyroidism, euthyroid on levothyroxine, and was diagnosed with cutaneous T cell lymphoma (CTCL). Due to disease progression on dapsone, PUVA and TAR baths, he was started on bexarotene. Soon after, he developed recurrent symptoms of hypothyroidism including fatigue, cold intolerance, dry skin, and myalgias. Workup revealed a TSH of <0.01 ulU/ml (0.27-4.20) with a free T4 of 0.6 ng/dl (0.9-1.7). After evaluation, his levothyroxine dose was increased. Repeat labs 3 months later showed a TSH of <0.01 with a free T4 0.8 ng/dl and T3 43 ng/dl (80-200). Over several months, levothyroxine titration to a supraphysiologic dose of 800 mcg daily was required, despite optimal administration, to normalize FT4. Given persistent hypothyroid symptoms and a low T3 level, liothyronine 5 mcg BID was added and resulted in clinical and biochemical euthyroidism. **Clinical Lessons:** Unlike in primary thyroid disorders, the TSH assay is unreliable in central hypothyroidism since values can be low, normal, or even mildly elevated; regardless, TSH has subnormal bioactivity. Inefficual TSH leads to a low T4, which is a required for diagnosis. Bexarotene, a derivative of Vitamin A, is a retinoid X receptor (RXR) selective ligand approved for the treatment of CTCL. The exact mechanism of bexarotene-induced thyroid dysfunction is not clear, although it involves both central and peripheral effects. Bexarotene inhibits TSH gene expression by decreasing the activity of the thyrotropin β subunit gene promoter in a dose-dependent and thyroxine-independent manner; TSH levels drop as early as 4-8 hours after exposure. Bexarotene also directly lowers T4 and T3 levels, even in athyreotic patients, by negatively impacting deiodinase activity and hepatic conjugation. Stopping bexarotene is often not possible given its effectiveness in CTCL. Therefore, thyroid hormone should be initiated with the goal of achieving a normal FT4, although as the current case demonstrates, massively supraphysiologic doses and/or the addition of liothyronine may be necessary to achieve clinical euthyroidism.