Continuing Medical Education Article

Uncommon Causes of Thyrotoxicosis

*JNM*, February 2008, Volume 49, Number 2

Authors

Erik S. Mittra\(^1\), Ryan D. Niederkohr\(^1\), Cesar Rodriguez\(^1\), Tarek El-Maghraby\(^2\)\(^3\), and I. Ross McDougall\(^1\)

\(^1\)Division of Nuclear Medicine and Molecular Imaging Program at Stanford, Department of Radiology, Stanford University Hospital and Clinics, Stanford, California; and \(^2\)Nuclear Medicine, Cairo University, Cairo, Egypt; and \(^3\)Nuclear Medicine, Saad Specialist Hospital, Al Khobar, Saudi Arabia

Disclosure

In accordance with ACCME Revised Standards for Commercial Support and SNM Conflict-of-Interest Policy, the author has indicated no relevant relationships that could be perceived as a real or apparent conflict of interest. Disclosure of a relationship is not intended to suggest or to condone bias but is made to provide participants with information that might be of potential importance to their evaluation of the activity.

Target Audience

All nuclear medicine physicians, endocrinologists, and thyroidologists.

Objectives
On successful completion of this activity, participants should be able to:

1. Understand and recognize uncommon causes of thyrotoxicosis.
2. Be able to differentiate each of the rare causes.
3. Be able to manage the rare causes of thyrotoxicosis.

Questions

1. What is the most common cause of thyrotoxicosis in the United States?
   A. Toxic nodular goiter.
   B. Factitious thyrotoxicosis.
   C. Graves’ disease.
   D. Silent thyroiditis.
   E. Nonthyroid medications.

2. Which of the following statements concerning TSH-secreting pituitary tumors producing hyperthyroidism is true?
   A. They are associated with infiltrative thyroid orbitopathy.
   B. The level of thyroid hormone in patients with such tumors is higher than that in patients with resistance to thyroid hormone at the level of the pituitary gland.
   C. They have proportionally higher levels of the α-subunit of TSH.
   D. They are the most common pituitary adenomas that produce functioning hormones.
   E. The optimal treatment is ablation of the thyroid with $^{131}$I.
3. Gestational trophoblastic disease (hydatidiform mole or choriocarcinoma) can induce thyrotoxicosis by which of the following mechanisms?

   A. The placenta stimulates the pituitary gland to secrete abnormally high levels of TSH.
   B. hCG is present in large amounts and has intrinsic thyroid-stimulating activity.
   C. Elevated serum estrogen levels stimulate the pituitary gland to secrete excess TSH.
   D. Placental tissue directly secretes excess TSH.
   E. Placental tissue induces generalized resistance to thyroid hormone.

4. A patient has elevated free T₄ and suppressed TSH. The thyroid is impalpable. The serum thyroglobulin level is less than 0.5 ng/dL. The 24-h uptake of ¹²³I is 1%. What is the likely diagnosis?

   A. Graves’ hyperthyroidism.
   B. Silent thyroiditis.
   C. Struma ovarii.
   D. Factitious thyrotoxicosis.
   E. The thyroid uptake probe was set for the energy of ¹³¹I.

5. A patient with tachyarrhythmia is treated with amiodarone. He loses weight and is tremulous. Cardiac failure worsens. The thyroid is slightly enlarged. Free T₄ is elevated, and TSH is suppressed. ¹²³I uptake at 24 h is 2%. Color flow Doppler imaging shows increased flow, and interleukin 6 values are normal. What is the best treatment?

   A. ¹³¹I ablation.
   B. Lithium.
C. Inorganic iodine.
D. Methimazole.
E. Cardiac transplantation.

6. You have gathered a history and examined a patient with symptoms and signs of thyrotoxicosis. You suspect the diagnosis is factitious thyrotoxicosis. What results do you expect from your evaluation of thyroid function?
   A. Low TSH and elevated thyroglobulin.
   B. High serum TSH and high 24-h radioiodine uptake.
   C. Low serum TSH and low 24-h radioiodine uptake.
   D. High serum TSH and low 24-h radioiodine uptake.
   E. Low serum TSH and high 24-h radioiodine uptake.

7. Hamburger thyrotoxicosis
   A. Is more common in women.
   B. Causes high serum TSH and high 24-h radioiodine uptake.
   C. Causes patients to present with a goiter.
   D. Presents as a regional outbreak.
   E. Has a predilection for patients who are owners of large dogs.

8. Which of the following statements is true?
   A. A syndrome like silent thyroiditis is seen after internal, but not external, radiation therapy.
   B. Transient hypothyroidism is often a component of the recovery phase of silent thyroiditis.
C. Direct blunt trauma cannot cause thyroiditis.

D. Recurrent episodes of silent thyroiditis occur in more than 50% of patients.

E. The most accepted etiology of subacute thyroiditis is a bacterial illness.

9. What is the appropriate dose of thyroxine for a 65-kg patient who is permanently hypothyroid after postpartum thyroid dysfunction?
   A. 2.5 µg.
   B. 25 µg.
   C. 125 µg.
   D. 250 µg.
   E. 2,500 µg.

10. A woman develops thyrotoxicosis 3 mo after delivery. She is nursing and wants to continue doing so until 6 mo. What is the best test for determining whether she has Graves’ disease or postpartum thyroid dysfunction?
    A. Twenty-four-hour thyroid uptake with 0.37 MBq of $^{131}\text{I}$.
    B. Twenty-four-hour thyroid uptake with 3.7 MBq of $^{123}\text{I}$.
    C. Response of symptoms to a β-blocker.
    D. Measurement of thyroid-stimulating immunoglobulin.
    E. Measurement of antithyroid peroxidase.