

Case of the Month

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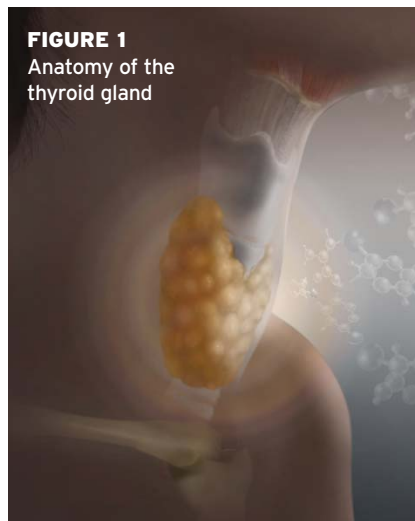


FIGURE 1
Anatomy of the thyroid gland

CASE

A 47-year-old woman presented with increased exertional heart rate of a few months' duration. She was a coffee drinker and initially attributed the tachycardia to her caffeine intake. However, avoiding caffeine did not resolve her symptoms. The patient was told that the results of a thyroid panel ordered by another clinician a few days earlier were within normal limits. A review of those laboratory results showed that her thyroid-stimulating hormone (TSH) was manually entered as <1.003 uIU/mL. Because this was not entered according to standard procedures, the laboratory was called for confirmation. The result had indeed been entered incorrectly; the correct value was <0.400 uIU/mL.

HISTORY Before her recent episodes of tachycardia, the patient was able to maintain a heart rate of 160 to 175 beats per minute during her daily 4-mile run. She also experienced a few episodes of palpitations; however, she denied any angina, shortness of breath, or dyspnea on exertion. She had no family history of coronary artery disease, but her mother had hypertension. She was initially unaware of any family history of thyroid disorders, but she later learned that her mother had

hypothyroidism. The patient was not taking any prescription medications. She was, however, taking numerous OTC supplements, including oral kelp capsules and numerous vitamins; she also drank a protein shake regularly and used sea salt in her home cooking. All of these contained iodine. A review of her medical record showed that all previous thyroid test results, BP measurements, and heart rates were within normal limits.

PHYSICAL EXAMINATION The patient seemed quite at ease on examination. BP was 145/89 mm Hg; pulse, 84 beats per minute; temperature, 97.6°F; and respirations, 16 breaths per minute. A visual examination revealed no ophthalmopathy. Palpation of the neck revealed no lymphadenopathy, no thyromegaly, and no tenderness around the thyroid gland (see Figure 1). Lungs were clear to auscultation bilaterally. Heart rate and rhythm were normal, without any murmurs, rubs, or gallops. The abdomen was soft, nontender, and without masses, with normal bowel sounds. No edema was noted, and pulses on upper and lower extremities were equal bilaterally. An ECG revealed a normal sinus rhythm.

WHAT IS YOUR DIAGNOSIS?

- *Wolff-Parkinson-White syndrome*
- *Premature atrial contractions from caffeine*
- *Hyperthyroidism secondary to exogenous iodine intake*

DISCUSSION

With the initial thyroid antibody tests pending, the working diagnosis was hyperthyroidism secondary to exogenous oral intake of iodine from the various OTC products. For the past 5 to 6 months, the patient had been taking oral kelp capsules for mild fatigue and, ironically enough, for thyroid health. To her credit, she researched kelp supplementation on her own and found an association between oral kelp supplements, which contain high amounts of

iodine, and thyroid disorders. In addition, one of the vitamins she was taking contained the recommended dietary allowance (RDA) of iodine. The protein shake also contained the RDA of iodine.

COMMENT A healthy body requires certain minerals, obtained through eating a normal diet. However, megadoses of certain minerals obtained through supplements can be toxic.¹ An oversupply of exogenous iodine by any means increases the risk of thyroid problems. The average RDA of iodine is 150 mcg/d, with a safe upper limit of 1,100 mcg/d.¹ This patient's total daily intake of iodine was over 3,000 mcg (3 mg), or approximately 15 times the RDA.

TREATMENT The patient was started on propranolol, 10 mg/d tapered up every 2 days until her symptoms improved. Her symptoms improved at 20 mg twice a day. Thyroid test results 6 weeks later indicated continuing hyperthyroidism. A subsequent thyroid uptake and scan revealed a mildly elevated 24-uptake of 28.5% in a mildly enlarged gland. These findings were compatible with hyperthyroidism and possibly Graves' disease. The patient chose to continue closely monitoring her symptoms for 6 months and to see an endocrinologist if there was no change at that time.

OUTCOME In a follow-up contact, the patient reported that she had stopped using all exogenous iodine products, her thyroid test results had returned to normal, and she had been asymptomatic for the past year. [JAAPA](#)

Joel Hill practiced family medicine for 10 years before retiring from the US Air Force and now works in general, thoracic, and vascular surgery in Rapid City, South Dakota. He has indicated no relationships to disclose relating to the content of this article.

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REFERENCES

1. Minerals and electrolytes: Introduction. Merck Medicus; Merck Manuals Home Edition Web site. <http://merck.com/mmhe/sec12/ch155/ch155a.html>. Updated February 2003. Accessed August 7, 2007.