CLINICAL VIGNETTE

Hypothyroidism Presenting With Isolated Myalgias

Diane Suzuki, M.D.

Case report

A 56- year-old man with a history of anxiety presented with a 4-week history of sudden onset, generalized muscle pains involving his upper and lower back, shoulders, hips, and hands. The pain worsened with activity and was associated with morning stiffness, particularly in his hand and lower back. He denied muscle weakness, joint pains, fevers, chills, constipation, cold intolerance, depression, dry skin, rashes, or weight change. He had no significant past medical history. He had quit smoking 17 years ago and drank alcohol occasionally. He denied using recreational drugs. His only medication was ibuprofen for the pain over the past 4 weeks.

On examination, body mass index was 29 and vital signs were unremarkable. No rashes or joint effusions were present. Back exam demonstrated decreased flexion and pain with flexion at the hips. Strength was 5/5 throughout. Sensation to light touch was symmetric and there was no muscle tenderness or increase in muscle size.

Laboratory studies showed a normal blood count and normal renal and liver profiles, Westergren sedimentation rate was elevated at 26 mm/hour. Urinalysis showed microscopic hematuria and creatine kinase was elevated at 743. CRP was elevated at 2.89, RA factor was slightly elevated at 23.3 IU/ml and ANA was negative. TSH was elevated at 70 uIU/ml. Both free T4 and free T3 were low at 0.57 ng/dl and 2.2 pg/ml. Radiographs of his cervical spine showed mild osteoarthritis from C4 to C7 with disc space narrowing and osteophytes with normal thoracic and lumbar-sacral studies. The patient was started on levothyroxine 0.05mg daily, which was later increased to 0.1mg daily. After 4 weeks of treatment he had normalization of his TSH and improvement of his muscular symptoms. He had complete resolution of his symptoms after eight weeks.

Discussion

Hypothyroidism is a common disease. The NHANES III study found the prevalence of hypothyroidism to be 4.6 % of the U.S. population with 0.3% of cases being clinical and 4.3% being subclinical hypothyroidism[1]. As clinicians, we are accustomed to encountering hypothyroid patients with the familiar signs and symptoms including fatigue, cold intolerance, weight gain, constipation, and dry skin. However, hypothyroidism can present in various ways making diagnosis difficult.

The case described was unusual in that the only presenting symptoms were proximal and distal myalgias without other more common symptoms of hypothyroidism. In reviewing the literature, cases have been described involving hypothyroidism with isolated muscle complaints. A case series by Rodolico presented 10 patients with only muscle complaints including myalgias, cramps or proximal weakness. All patients had Hashimoto's thyroiditis and all symptoms resolved with levothyroxine treatment[2]. George reported three cases of hypothyroidism with myalgias, fatigue, and extremity swelling. All patients had TSH levels >150 mU/L and creatine kinase levels ranging from 296 – 4214 U/L. All patients had resolution of their symptoms, although the patient with creatine kinase level of 4214 took longer to have his symptoms resolve.

Two specific syndromes have been described with regard to hypothyroidism and

musculoskeletal symptoms. The first is Hoffman's syndrome, which is defined as hypothyroidism presenting with muscle stiffness and pseudohypertrophy in adults. It was first described regarding patients that had undergone thyroidectomy[4]. The second is Kocher-Debre-Semelaigne syndrome which is described as pseudo muscle hypertrophy in children associated with long standing hypothyroidism.

Musculoskeletal symptoms are estimated to occur in 30%-80% of patients with hypothyroidism[3]. In addition, creatine kinase may be elevated in 70-90% of hypothyroidism patients[4]. This rise in creatine kinase levels is secondary to increased capillary permeability and levels correlate with the degree of severity of hypothyroidism[5]. Muscular complaints can be explained by thyroid hormone having direct effects on muscle. The mitochondrial membrane of skeletal muscle has T3 receptors. During hypothyroidism, oxidative metabolism is impaired leading to low mitochondrial activity and low ATP turnover. This slows the release of calcium in the endoplasic reticulum, which manifests clinically as delayed muscle relaxation. Also, during exercise, patients with hypothyroidism have higher lactate levels during exercise causing a decrease in intracellular pH, which leads to muscle pain, muscle cramps, and fatigue[3].

Muscle biopsies of hypothyroidism patients have shown muscle fiber enlargement with focal myofibrillary degeneration[3]. With polymyositis, biopsies show evidence of inflammation with perivascular and interstitial chronic inflammatory cells with myofibril degeneration and regeneration[3]. For clinical purposes, a muscle biopsy is usually not required as patients respond fairly promptly to thyroid hormone replacement[5]. Electromyographic studies will often show frequent low- amplitude and short-duration polyphasic motor units[3]. These findings differ from polymyositis where "complex repetitive charges, positive sharp waves at rest, and low-amplitude polyphasic potentials on contraction" are seen[3].

This case demonstrates how hypothyroidism can present in an atypical fashion and how important it is to include hypothyroidism in the differential for isolated myalgias.

REFERENCES

1. **Hollowell JG, Staehling NW, Flanders WD, Hannon WH, Gunter EW, Spencer CA, Braverman LE**. Serum TSH, T(4), and thyroid antibodies in the United States population (1988 to 1994): National Health and Nutrition Examination Survey (NHANES III). *J Clin Endocrinol Metab*. 2002 Feb;87(2):489-99. PubMed PMID: 11836274.
2. **Rodolico C, Toscano A, Benvenga S, Mazzeo A, Bartolone S, Bartolone L, Girlanda P, Monici MC, Migliorato A, Trimarchi F, Vita G**. Myopathy as the persistently isolated symptomatology of primary autoimmune hypothyroidism. *Thyroid*. 1998 Nov;8(11):1033-8. PubMed PMID: 9848719.
3. **George G**. Hypothyroidism presenting as puzzling myalgias and cramps in 3 patients. *J Clin Rheumatol*. 2007 Oct;13(5):273-5. PubMed PMID: 17921796.
4. **Mastropasqua M, Spagna G, Baldini V, Tedesco I, Paggi A**. Hoffman's syndrome: muscle stiffness, pseudohypertrophy and hypothyroidism. *Horm Res*. 2003;59(2):105-8. PubMed PMID: 12589116.
5. **Kuo HT, Jeng CY**. Overt hypothyroidism with rhabdomyolysis and myopathy: a case report. *Chin Med J* (Engl). 2010 Mar 5;123(5):633-7. PubMed PMID: 20367994.

Submitted on March 31, 2011