Hoffmann's Syndrome: A Case Report

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Key Words

Hoffmann's syndrome · Pseudohypertrophy · Hypothyroidism

Abstract

Objective: We report a very rare case of Hoffmann's syndrome with muscle hypertrophy complicating hypothyroidism. **Clinical Presentation:** A 24-year-old man presented with a 2-year history of forgetfulness, swelling in his face, shoulder and calf, and motor weakness in his lower extremities. His calf and shoulder muscles were hypertrophic. Neurological examination revealed hoarseness of the voice, proximal muscle weakness, reduced deep tendon reflexes and a mildly ataxic gait. Laboratory tests indicated markedly elevated serum muscle enzymes and lipids, a high thyroid-stimulating hormone level and low free triiodothyronine and free thyroxine levels. Electromyographic evaluation showed myopathy. **Intervention:** Oral L-thyroxine treatment was started and at a 1-month follow-up examination, mental status and physical performance were improved. **Conclusion:** This report shows that in the differential diagnosis of myopathy with pseudohypertrophy, Hoffmann's syndrome should be considered.

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Introduction

Hypothyroidism can cause several symptoms, including fatigue, weight gain, cold intolerance, mental slowing, muscle cramping, heart enlargement and myxedema

coma [1]. Neuromuscular findings in thyroid dysfunction are usual, occurring in 75% of hypothyroid and 67% of hyperthyroid patients [2]. Myopathy associated with hypothyroidism can be divided into 4 subtypes: Kocher-Debré-Semelaigne syndrome, Hoffmann's syndrome, atrophic form and myasthenic syndrome [3, 4]. Hoffmann's syndrome is a very rare form of hypothyroid myopathy, first described by Hoffmann in 1897. This syndrome is characterized by the presence of hypothyroidism with muscle stiffness and pseudohypertrophy in adults. Muscle hypertrophy is an extremely rare finding in hypothyroid patients [4–8].

We present a case of Hoffmann's syndrome documented by clinical signs, laboratory tests and electromyographic findings.

Case Report

A 24-year-old man was admitted to our hospital with a complaint of fatigue and motor weakness in his lower extremities. The symptoms had first started 4 years previously with stiffness in his legs during walking. Weakness had increased in the past year. In addition, he had experienced forgetfulness, reduced school success, cold intolerance, weight gain, swelling in his face, shoulder and calf, and muscle cramping for 2 years.

Upon physical examination, the patient was slightly overweight; blood pressure was 90/60 mm Hg, heart rate 54 beats/min and body temperature 36°C. He complained of dryness of the skin, loss of body hair and swelling, especially of the face, shoulder and calf (fig. 1). Thyroid gland examination was normal. Ex-

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Fig. 1. a Swelling of the face and shoulders. **b** Pseudohypertrophy of the calves.

Fig. 2. Reduction of calf circumference by 3 cm, increase in body hair.

amination revealed hoarseness of the voice, proximal muscle weakness (Medical Research Council grade: 4/5), deep tendon reflexes with reduced and delayed relaxation, mildly ataxic gait. His calf and shoulder muscles were hypertrophic.

Laboratory tests including complete blood count, electrolytes, erythrocyte sedimentation rate and urine analysis were normal. Serum muscle enzymes and lipids were markedly elevated; creatine phosphokinase (CK) was 8,284 U/l (normal 21–232 U/l), lactic dehydrogenase 759 U/l (100–190 U/l), aspartate transaminase 188 U/l (15–37 U/l), alanine transaminase 234 U/l (30–65 U/l), triglycerides 212 mg/dl (0–200 mg/dl), total cholesterol 277 mg/dl (0–200 mg/dl) and low-density lipoprotein cholesterol 208 mg/dl (0–130 mg/dl). The thyroid-stimulating hormone level was high: 100 μ IU/ml (0.270–4.20 μ IU/ml); the free triiodothyronine level was low: 0.260 pg/ml (2.57–4.43 pg/ml), and the free thyroxine level was also low: 0.103 ng/dl (0.932–1.71 ng/dl). The anti-thyroid thyroglobulin antibody (300.4 U/ml) and anti-thyroid microsomal antibody (1,980.0 U/ml) levels were high. The electrocardiogram showed low QRS voltage and bradycardia. Holter electrocardiography and echocardiography were normal. The findings of ultrasound examination and needle aspiration biopsy of the thyroid gland were compatible with thyroiditis. Electromyographic evaluation showed myopathy (especially gastrocnemius muscle). The amplitude and duration of motor unit potentials recorded during slight voluntary activation were reduced.

The diagnosis was Hoffmann's syndrome with hypothyroidism, probably resulting in autoimmune chronic thyroiditis. Oral L-thyroxine treatment was started (0.025 mg/day) and the dose was elevated gradually to a maintenance dosage of 0.1 mg/day. In the follow-up examination after 1 month, calf circumference was reduced by 3 cm, body hair increased and muscle enzymes were reduced (fig. 2). Physical performance and mental status improved, leading to improved success in school.

Discussion

Hoffmann's syndrome is a very rare form of hypothyroid myopathy in adults that causes proximal weakness and muscle hypertrophy [7]. Patients complain of cramps and pain in the muscles of the shoulder and pelvic girdle, which increase with movement. The most common findings are enlarged muscles, slow movements, delayed deep tendon reflexes, cramps, myoedema and proximal weakness of extremities [7]. Our patient complained of difficulty in walking, swelling of his face, shoulder and calf muscles, painful cramps, fatigue, forgetfulness and reduced school success for 2 years.

Muscle hypertrophy is very rare and its cause unknown. It has been postulated that the mechanisms involved could include an increase in connective tissue, size and number of muscle fibers. Studies have shown changes in muscle fibers from fast twitching type II to slow twitching type I, accumulation of glycosaminoglycans and abnormalities in oxidative enzymatic activity [4–6, 9]. Once regulation of hormonal balance is begun, myopathy may be reversible with a good prognosis [4, 5] as was the case in our patient where hypertrophy of the calf muscle began to recede after treatment.

The CK level is elevated mildly to moderately in hypothyroid patients (10–100 times normal). Serum CK concentration did not correlate with muscle weakness [7]. Rhabdomyolysis is rare, and the distinguishing features are muscular symptoms and increased CK concentrations. This condition can be complicated by acute tubular

necrosis and renal failure. The cause of rhabdomyolysis in hypothyroidism remains unknown, but theories such as impaired glycogenolysis and mitochondrial oxidative metabolism and possible autoimmune mechanisms have been suggested [9, 10]. The CK level of our patient was very high but not complicated.

Hypothyroid patients may experience myopathy, mononeuropathy and sensorimotor axonal polyneuropathy in electroneuromyography [2, 7]. Needle electromyography of our patient showed myopathy. Neither mononeuropathy nor polyneuropathy were observed.

Conclusion

We report a case of Hoffmann's syndrome with muscle hypertrophy complicating hypothyroidism. Symptoms have been alleviated with treatment and no complications. In the differential diagnosis of myopathy with pseudohypertrophy, Hoffmann's syndrome should be considered.

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