Uncommon presentation of a common disorder

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Abstract

We report about a young male who presented with generalized muscle stiffness, involving the limb, facial, and paraspinal muscles. The stiffness was severe enough to restrict all his daily activities, progressively increased with movements and also produced recurrent falls. This clinical picture resembled one of stiff person syndrome. As he had hypertrophy of calf muscles and generalized muscle tautness he was evaluated for other disorders which can resemble stiff person syndrome. Investigations revealed severe hypothyroidism with thyroid antibodies being elevated. This case is reported to highlight the fact that myopathy as a presenting manifestation of hypothyroidism can simulate stiff person syndrome. It is essential to identify the condition early as it recovers fully with treatment. Our patient responded well to thyroid replacement therapy and was able to lead a normal life.

Key Words

Action induced muscle spasms, hypothyroidism, muscle stiffness, stiff person syndrome

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Introduction

Thyroid disorders can present with varied neurological manifestations affecting the entire neuraxis. Hypothyroidism can manifest as coma when it involves the brain and at the other end of the spectrum can produce neuropathies and myopathies when it involves the peripheral nerves and muscles. Hypothyroid myopathy can present with stiffness, weakness, cramps and aching muscles. It can also resemble polymyositis. Occasionally, stiffness and tautness of muscles can be the only manifestation of hypothyroidism. In such situations, it has to be differentiated from stiff person syndrome. Hypothyroid myopathy and stiff person syndrome can both have muscle stiffness along with spasms predominantly involving the axial muscles and later extending to the limb muscles. In both the conditions, the stiffness increases on action, producing falls and impairing activities of daily living. It is imperative to correctly identify both the conditions as hypothyroid myopathy responds well to thyroid replacement therapy, whereas stiff person syndrome should be treated with steroids.

Case Report

A 30-year-old male, working as a tailor in an export company, presented to us with complaints of stiffness in lower back region for one and a half months duration followed by stiffness of limbs and slurring of speech for 1 month duration. The patient was apparently normal 2 months back, when he developed fever which was intermittent, high grade, and associated with chills and rigors. He had generalized myalgia. There was no history of headache or vomiting. Though he became afebrile after 5 days, he continued to have myalgia and general malaise. In addition he developed pain over the lower back region, which increased in intensity on exertion. He went back to his job after 10 days but had difficulty carrying out his work due to the low back pain. About 3 weeks later, he noticed stiffness over the lower back region, which restricted his activities. He could not bend down and also had difficulty in turning around. The stiffness gradually spread to involve the entire trunk and neck in the next 15 days. Two weeks later, the patient developed swelling of the face, right upper limb, and right lower limb. He also had diffuse pain and stiffness over the same regions for which he had consulted a local practitioner of alternative medicine. The swelling gradually subsided but the pain and stiffness persisted. Over the next 5 days, the patient developed pain and stiffness of the left upper limb and left lower limb also, but of a lesser intensity.

The patient noticed progressive increase in stiffness of neck, trunk, and limbs (Right > Left [*R* > L]) on walking about 20–30 meters, after which he was unable to take another step. He had to stop for 10 minutes before resuming to walk. He gave history of falling down en bloc backwards (4–5 episodes) when he had tried to walk during the periods of severe stiffness. The stiffness was moderate at rest. He had severe restriction of neck and trunk movements. He had difficulty in using his upper and lower limbs (R > L) for all daily activities due to the

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severe stiffness. He developed stiffness of hands while mixing food and brushing teeth. He had stiffness of jaw muscles on prolonged chewing. He developed stiffness of facial muscles after speaking for some time causing reduction in voice along with slowness and slurring of speech.

The patient's symptoms were initially progressive but had been static later on. He gave no history of precipitation of symptoms by auditory or tactile stimuli. He had no thinning of limbs or muscle twitchings or other involuntary movements of limbs. He had no sensory disturbances or higher function disturbances or cranial nerve involvement or bladder or bowel disturbances. He had no difficulty in releasing finger grip, no aggravation of symptoms by cold, no abnormal posturing of limbs, no lhermitte's symptom, no shooting pain in the limbs, no history of altered color of urine or reduced urine output, no breathing disturbances, no cough with expectoration or chest pain, no head or spinal injuries, and no drug or toxin intake. Past/personal/family history—uneventful

Examination

The patient was well built and nourished; vitals were normal; and higher mental functions were normal. All cranial nerves were normal except for mild restriction of mouth opening. On assessment of the spinomotor system, he was found to have mild calf muscle hypertrophy bilaterally; all muscles were hard and taut on palpation. He had hypertonia of both upper and lower limbs (R > L).

Muscle power examination was restricted by the severe muscle stiffness and hypertonia; medical research council (MRC) grade in right upper limb was 4- to 4, in left upper limb it was 4+, 3 to 4- in right lower limb, and 4 to 4+ in left lower limb. All superficial reflexes were normal. All deep tendon jerks were depressed except for ankle jerk, which was normal on both sides. No fasciculations were noted; no other involuntary movements. Sensory system examination was normal; there were no cerebellar signs; Gait was robotic.

Our working diagnosis was stiff person syndrome.

Investigations

Complete hemogram, blood sugar, blood urea, serum creatinine, serum electrolytes, urine routine examination, liver function tests, and peripheral blood smear were normal. He had hypercholesterolemia and hypertriglyceridemia. His chest X-ray was normal. Electrocardiogram (ECG) showed low voltage complexes with a heart rate of 64 per minute. Serum creatine kinase (CK) was 476 units per liter. cerebrospinal fluid (CSF) sugar and proteins were normal. CT brain was normal. Ultrasonography (USG) abdomen revealed cholelithiasis. Nerve conduction studies were normal. Needle electromyogram (EMG) showed no spontaneous activity, incomplete interference (severe muscle stiffness restricted his limb movements) and myopathic potentials. Serum thyroid stimulating hormone (TSH) was 150 micro units per milliliter (*N* = 0.3–5.5 micro units per milliliter); serum free T4 was 0.31 nanograms per deciliter (*N* = 0.7–1.8 nanograms per deciliter); serum T3 was 1.61 picograms per deciliter (*N* = 1.7–4.2 pg/dl); Antimicrosomal antibody and antithyroglobulin antibody were elevated.

Discussion

Our patient presented with symptoms of severe generalized asymmetric muscle stiffness including the axial muscles and action induced muscle spasms following an episode of fever. The clinical picture resembled one of stiff person syndrome, as evidenced by the severe paraspinal muscle stiffness to the extent of causing falls. The peculiar feature was the progressive increase in muscle stiffness with action or movements of limbs and trunk.

Clinical examination was restricted by the severe muscle stiffness. Investigations revealed the presence of an underlying myopathy, as shown by the elevated CPK and myopathic potentials on EMG which differentiated hypothyroid myopathy from stiff person syndrome. He had severe hypothyroidism as evidenced by the elevated serum TSH and reduced serum thyroxine levels. Serum thyroid antibody levels were also elevated.

Stiff person syndrome (SPS) is characterized by progressive rigidity, fluctuating tonic muscle contractions of the axial musculature and circulating antibodies to the enzyme glutamic acid decarboxylase (GAD).[1] Continuous contraction of agonist and antagonist muscles caused by involuntary motor-unit firing at rest are the hallmark clinical and electrophysiologic signs of the disease, which was not present in our patient.

Hypothyroid myopathy typically manifests as polymyositis-like myopathy with proximal muscle weakness and an increased creatine kinase level. It sometimes manifests as muscle enlargement (pseudohypertrophy); in adults, this condition is called Hoffman syndrome.[2] In children with hypothyroid disease (cretinism), the pattern of proximal weakness and muscle enlargement is known as Kocher–Debré–Sémélaigne syndrome.[3]

Neuromuscular and musculoskeletal manifestations such as weakness, pain, aching, stiffness, and rhabdomyolysis occur in 30–80% of individuals with hypothyroidism.[4] Slowed muscle contraction and relaxation, in hypothyroid myopathy, may be caused by a shift in the distribution of muscle fiber types from fast-twitch fibers to slow-twitch fibers. A reduction in muscle mitochondrial oxidative capacity and beta-adrenergic receptors, as well as the induction of an insulin-resistant state, may result in these changes.[5] Evidence from a study by Sinclair and colleagues suggests that a decrease in muscle carnitine in patients with either hypothyroidism or hyperthyroidism may contribute to thyroid myopathy.[6]

The global inhibition of the main oxidative pathways (substrate incorporation, substrate oxidation) and of the respiratory chain within cells also may cause myopathic symptoms.[7] A diminished energetic consumption is related partially to a transition in the myosin isoforms, which express a slower adenosine triphosphatase, and to an impairment of the trans sarcolemmal transports. All of these factors may contribute to muscle weakness, fatigue, and exertional pain.[8] Exercise intolerance could be due to an abnormal recruitment of several metabolic

pathways, such as glycolysis, related to the mitochondrial metabolism impairment. An abnormal accumulation of protons and monovalent phosphate ions (which are involved in the actin–myosin interaction), as well as abnormal Ca++ metabolism, also may cause reduced exercise tolerance.[9]

Delayed Ca++ reuptake by the sarcoplasmic reticulum prolongs muscle contraction. Although not proven, this type of prolongation of muscle contraction is also thought to cause muscle hypertrophy.[10] Slowness of muscle relaxation and of muscle contraction are noted in hypothyroid myopathy. Deep tendon reflexes are delayed in approximately 85% of patients with hypothyroidism.[11]

Muscle enlargement, stiffness, and cramping are a constellation of findings seen in individuals with hypothyroidism which was also seen in our patient. Hypothyroidism can impair mitochondrial metabolism, resulting in decreased muscle energy production.[12,13]

Our patient showed marked improvement 2 weeks after treatment with levo-thyroxine 100 microgram per day. The muscle stiffness, muscle enlargement and weakness improved fully and he is able to pursue his normal work. Although muscle hypertrophy, proximal muscle weakness, and stiffness can occur in hypothyroid myopathy, such extensive and severe axial stiffness precipitating falls and action induced progressive increase of stiffness, in the absence of systemic symptoms and signs of hypothyroidism makes our case different from the usual cases of hypothyroid myopathy.

We could not find any case reports of hypothyroid myopathy simulating stiff person syndrome after thorough literature search. It is essential that it should not be mistaken for stiff person syndrome with entirely different treatment option. Early recognition of this endocrine myopathy is essential, as it is fully amenable to treatment.

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