

**CASE REPORT**

Hoffman Syndrome As First Manifestation of Hypothyroidism: A Rare Case

Rudrajit Paul, Pradip K Sinha, Pradip Mondal, Amit K Banerjee

Abstract

Hypothyroidism in adults can manifest as myopathy. Often, other features of hypothyroidism are associated with it. But rarely, it can only present as muscle pseudohypertrophy along with cramps and weakness: a condition called Hoffman's Syndrome. This shows high elevation of muscle enzymes and myopathy patterns on electromyography. This condition responds very well to thyroxin replacement. The reporting of Hoffman's Syndrome is very rare from Indian subcontinent, and probably this is the first case from eastern India.

Key Words

Hoffman Syndrome, Hypothyroidism, Myopathy

Introduction

Hoffman Syndrome is a rare adult pseudohypertrophic myopathy associated with hypothyroidism, usually autoimmune thyroiditis. These patients present with focal or generalized muscle hypertrophy and other systemic features of hypothyroidism (1). There are associated biochemical abnormalities, especially rise of muscle enzymes. However, muscle hypertrophy as first presentation of hypothyroidism is quite rare. There are very few case reports from India, and to our knowledge, this is the first report from Eastern India.

Case Report

A 58 year old male presented with gradually increasing swelling of both legs below knee (left more than right) for last three months. He also reported mild weakness of both lower limbs for last two months along with night cramps. On examination the legs were non-tender and there was no local redness or raised temperature. There

was mild pallor and face looked puffy (*Fig.1*). There was no goiter. On CNS examination calf muscles were bilaterally hypertrophied with a doughy feel (*Fig.2*). The left calf was more hypertrophied than the right. Power of his lower limb muscles were 4/5. Delayed relaxations of ankle jerks were detected; there was no other neurodeficit.

Laboratory tests showed, hemoglobin 9.3 gm% with MCV of 100.5 fL. Other cell lines were normal. Serum sodium was 126.7 mEq/L. Liver function test showed SGOT 350 IU/L and SGPT 104 IU/L, but other parameters were normal. Serum cholesterol was 250 mg/dl. Serum creatinine phosphokinase (CPK) was 6780 IU/L (normal <190IU/L) and aldolase of 26 IU/L (N <7.6IU/L). Serum Lactate dehydrogenase (LDH) was 1090 IU/L (N <470IU/L). ECG showed low voltage complexes, sinus rhythm and rate 66/minute. Blood test for thyroid

From the Department of Medicine, Medical College Kolkata 88, College Street, Kolkata 700 073. West Bengal, India

Correspondence to :Dr. Rudrajit Paul, 15/5 Bose Pukur Road, Kolkata 700 039. West Bengal, India.



Fig. 1 Patient Presenting with Left Mastoid Region Swelling



Fig 2. The Legs Showing the Hypertrophied Calf Muscles (left: red arrow>right)

Table 1. Table Showing the Clinical Features and Laboratory Parameters at Presentation and After Treatment

Measurement	Weight (kg)	Calf Circumference(cm)	Proximal Power(MRC)	CPK (IU/L)	ALDOLASE (IU/L)	LDH (IU/L)	SGOT (IU/L)	TSH mIU/ml
Before Therapy	66	R-44 L-41	4-/5	6780	26	1090	350	113.05
1 Month	65	R-42 L-41	4+/5	3300	-	560	178	-
4 Months	63	R-40 L-40	4+/5	1650	6	233	39	12

function showed, TSH 113.05 mIU/ml (N: 0.6-5 mIU/ml); fT3 = 33ng/dL (N=58-160 ng/dl); fT4= 1.26 mg/dl (N=4.87-11.72 mg/dl). Anti- microsomal antibody (TPO) was positive 15 IU/ml (N<5.61IU/ml) (done by chemiluminiscence method; Abbott). Ultrasonography of the calf muscles showed increased muscle mass with focal accumulation of connective tissue.EMG showed decreased amplitude of contraction. Doppler study of lower limb vessels was normal and echocardiography showed chink of pericardial effusion with preserved LV systolic function. Thus the case was finally diagnosed as a case of hypothyroidism presenting with pseudohypertrophy of muscles as the first presentation, known as Hoffman's syndrome. The patient was put on oral thyroxin replacement and at four months follows up,

his calf muscle size was decreased (*tables 1*) and his serum creatinine phosphokinase was 1650 IU/L.

Discussion

Skeletal muscle involvement in hypothyroidism may be in the form of proximal myopathy, pseudo hypertrophy, myositis or polymyalgia rheumatic (1). Type 1 or type 2 fibre atrophy or hypertrophy, myofibril necrosis and regeneration or prominent core-like areas containing amorphous granulo-filamentous material are common pathological findings, which often reverse with treatment (1,2). Serum CPK is usually modestly elevated, though high rise and resolution after successful treatment is also described (3).

Muscle hypertrophy with stiffness as first presentation of hypothyroidism is quite rare (4). Hoffmann's syndrome



is a specific, rare form of hypothyroid myopathy, which causes proximal weakness and pseudo hypertrophy of muscles, due to connective tissue deposition (5). Usually this is sporadic, though reports of Hoffman syndrome occurring in family members throw light on a genetic basis for the disease (6).

Very few cases of Hoffman syndrome has been reported from India (4,5,7). Chopra *et al.* noticed hypertrophy of almost all muscles of body, especially calf and arm muscles (7). We observed enlargement of only the bilateral calf muscles in an asymmetrical distribution along with a sense of stiffness and slight discomfort on moving the legs. Studies of skeletal muscle have shown that changes in expression of the myosin heavy gene accompany hypothyroid states (2). However no correlation has been found between CPK levels and circulating concentration of T3, T4 and thyrotropin. Muscle biopsy is not essential for diagnosis. The electrophysiological study may be compatible with neurogenic, myogenic, a mixed patterns, or even normal. In our case, there was only decreased amplitude in EMG.

Calf muscle hypertrophy can have a variety of causes like genetic dystrophies, myositis, Sarcoid infiltration and neurogenic hypertrophy (4,8). The differentiation between these entities is done by clinical features, serum markers like TSH, EMG studies and response to thyroxin replacement (4). However, since Hoffman Syndrome can present without other manifestations of hypothyroidism, a high degree of suspicion is needed. A case report by Kaux *et al* showed that Hoffman Syndrome can present in the emergency with severe asthenia and Arthralgia. In them, rapid thyroxin replacement brings quick relief (9).

Hoffman syndrome has quite good prognosis. In some of the reported cases, the symptoms remitted by three

months (4, 10). Worsening of symptoms in some at the beginning of treatment may occur, probably caused by rise in metabolic demand induced by thyroxin. In these cases, the concomitant use of steroids during some time of the treatment, as membrane-stabilizing effect can be beneficial (10).

References

1. Mastaglia FL, Ojeda VJ, Sarnat HB, Kakulas BA. Myopathies associated with hypothyroidism: a review based upon 13 cases. *Inter Med J* 1988; 86: 799-806
2. Lin RT, Liu CK, Tai CT, Lai CL. Hypothyroid myopathy-pathological and ultrastructural study. *Kaohsiung J Med Sci* 2000; 16:68-75.
3. Scott KR, Simmons Z, Boyer PJ. Hypothyroid myopathy with a strikingly elevated serum creatine kinase level. *Muscle and Nerve* 2002; 26: 141-44
4. Udayakumar N, Rameshkumar AC, Srinivasan AV. Hoffmann syndrome: Presentation in hypothyroidism. *J Postgrad Med* 2005;51:332-33
5. Qureshi W, Hassan G, Khan GQ, *et al.* Hoffmann's syndrome: a case report. *Ger Med Sci* 2005; 3: 05.
6. Ghervan C, Tibre V, Prisca C, Duncea I. Muscular pseudohypertrophy associated with Hashimoto's thyroiditis (Hoffmann syndrome) - First familial case report. *Acta Endocrinologica* 2009; 5(1): 107-16
7. Chopra BK, Singh G, Puri A. Hoffman's Syndrome (hypothyroid Myopathy). *J Assoc Physicians India* 1972;20:387-90
8. Pareyson D, Morandi L, Scaioli V, *et al.* Sghirlanzoni. Neurogenic muscle hypertrophy. *J Neurology* 2008 ; 236: 292-95
9. Kaux JF, Castermans C, Delmotte P, Bex M. Hoffmann syndrome presenting to the emergency department. *Ann Readapt Med Phys* 2007 ;50:310-12
10. Vasconcellos LFR, Peixoto MC, Oliveira TN, Penque G, Leite A, Claudia C. Hoffman's syndrome: pseudohypertrophic myopathy as initial manifestation of hypothyroidism. Case report. *Arq Neuro-Psiquiatr* 2003; 61(3B): 851-54.