

Hoffmann's Syndrome "Hypothyroid Muscular Pseudohypertrophy": A Case Report

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Abstract: We report a case of Hoffmann's syndrome with muscle hypertrophy complicating hypothyroidism, in an adult patient. Clinical manifestations, laboratory investigations and electromyography findings were documented. This case was reported because of its rarity and to emphasize the effects of hypothyroidism on muscular tissues so as to avoid delay in diagnosis and mismanagement. The reporting of Hoffman's Syndrome is very rare from Africa, and probably this is the first case from Sudan..

Keywords: Hoffmann's syndrome; Hypothyroidism; Pseudohypertrophy.

INTRODUCTION

The neuromuscular manifestations of hypothyroidism vary from delayed relaxation of deep tendon jerks to full blown myopathy. Different myopathies were associated with hypothyroidism and can be divided into five subtypes: Kocher-Debré-Semelaigne syndrome, Hoffmann's syndrome, atrophic form, myasthenic syndrome and polymyositis-like syndrome [1,2]. Hoffmann's syndrome is a very rare form of hypothyroid myopathy, first described by Hoffmann in 1897. This syndrome occurs in adults, is characterized by the presence of hypothyroidism with muscle stiffness, pseudohypertrophy, varying degrees of muscle weakness and often painful muscle cramps[3,4]. Similar to the adult Hoffmann's syndrome, is Kocher-Debre-Semelaigne syndrome, which occur in childhood [5,6] and is usually associated with congenital hypothyroidism [7].

CASE REPORT

A 37-year-old Sudanese male presented with one year history of progressive lower limb weakness, facial puffiness and noticeable increase in calf muscle of both legs, he is also mute and deaf since the age of 7 years. He doesn't have any mental incapacity and he has no significant symptom related to other systems.

His past medical history is unremarkable apart from measles at age of seven and treated in hospital for a couple of weeks, he was discharged in a good health. He lives with family, married with three kids and work as free labourer. He is not smoker or alcohol consumer.

On examination he appeared lethargic and his activities were slow. His body weight was 63 kg, height 180 cm and body mass index (BMI) was 19.4 kg/m². His pulse was slow (50 beats/min) regular otherwise normal vital signs. He was pale, has earthy complexion, peri orbital edema, big tongue and bulky hands with rough skin (**Figure 1 and 2/A**). Thyroid was non-tender and not enlarged. Heart, chest, abdomen were normal. On neurological examination he was mentally intact, has bilateral deafness murmuring harsh voice rather than absolute mutism. There was proximal myopathy of both upper and lower limbs and classical delayed relaxation of deep tendon reflexes. Musculoskeletal system examination revealed bulky gastrocnemius muscle with the girth of 43 cm of both legs at the level of maximum calf muscles enlargement(**Figure 3**).

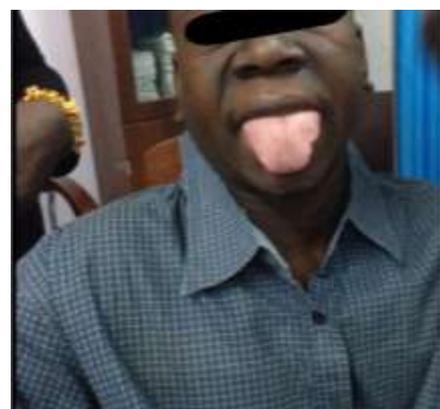


Figure1: Facial features of the patient showing periorbital oedema, macroglossia

earthy complexion and loss lateral eyebrows.

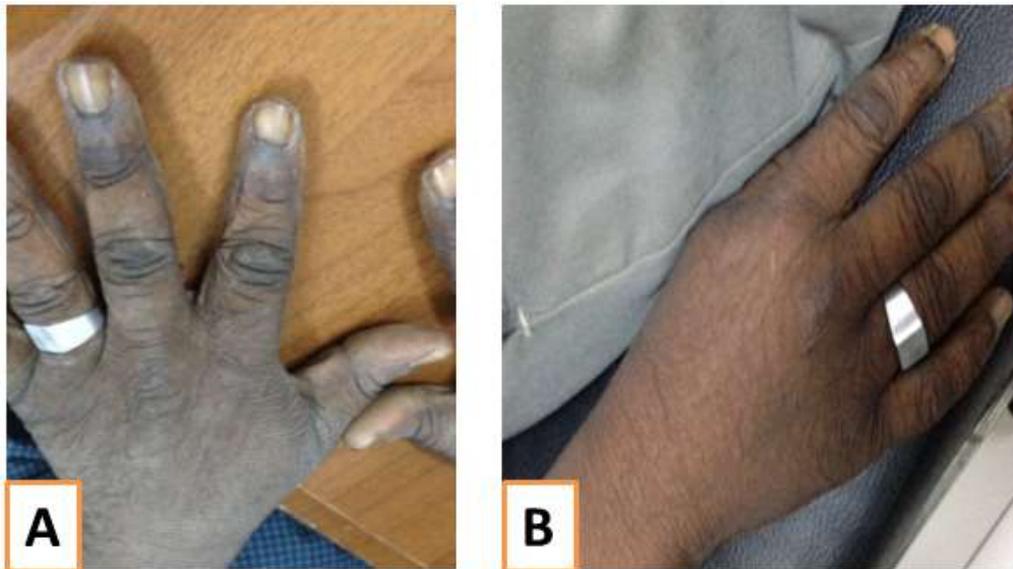


Figure 2: Photograph of the patient's hand showing (A) dry coarse skin before treatment, (B) three weeks after L-thyroxin therapy



Figure 3: Photograph of the patient showing hypertrophy of calf muscles of both the lower limbs (A) posterior view (B) anterior view during scanning

Investigation:

He was found to have hypothyroidism [TSH >100 IU/mL (normal 0.27–4.2 IU/mL), total T3<0.19ng/ml (normal 0.58–1.59ng/ml), T4 0.67µg/dL (5.1–14.1µg/dL)]. His creatinine phosphokinase(CPK) was 1745 IU/L(normal<135 IU/L), serum potassium 2.7mmol/L, haemoglobin 8.6 g/dl with MCV 101.2fl and ESR 100mm/h.

In nerve conduction test; CAMPs of right, median, ulnar, peroneal and tibial nerves showed normal amplitude, DML and CV. SNAPs of right median, ulnar, and sural nerves showed normal

amplitude DSL, and CV. F responses of right median, ulnar, tibial and peroneal nerves showed normal latencies and unremarkable nerve conduction.

Needle electromyography (EMG) was done and the sampled muscles were FDI, ADM, APB, EIC, biceps brachii, vastuslateralis, biceps femoris, tibialis anterior and gastrocnemius. No spot activity, early recruitment, minimally cleared interference pattern on biceps brachii, vastuslateralis, biceps and gastrocnemius. Motor unit action potentials (MUAPS) showed shorter duration, small amplitude with polyphasic pattern especially on vastuslateralis. Distal

muscles on both legs and hands showed nearly normal electrical activity. No myotonic features but myopathic needle EMG pattern.

Ultrasonography of the calf muscles showed increased muscle mass with focal accumulation of connective tissue. Echocardiography showed preserved LV systolic function. Thus the case was finally diagnosed as a case of hypothyroidism presenting with pseudo-hypertrophy of muscles as the first presentation, known as Hoffman's syndrome.

The patient was put on thyroxin supplement in building up dose starting with 25µg /day to target of 200µg/day over two months. The short term follow up of patient showed gross improvement and the earthy skin changes revert to normal (**Figure 2/B**).

DISCUSSION

In reported cases of Hoffman syndrome (**Table 1**); most of the patients (92.3%) showed male preponderance, their mean age was 37.5 years (range 24 -58) years and none was reported from Africa. The symptoms in most of the cases started two months to thirteen years prior to presentation with only two cases starting from childhood [1-12].

Symptoms of hypothyroidism varies from no symptoms as reported in a patient presented solely with myopathic features and calf pseudohypertrophy in absence of other systemic symptoms [8]. Some patients will present with progressive stiffness of lower limbs, generalized muscle hypertrophy and myalgia [3]. While other presents with features of proximal muscle weakness of both upper and lower limbs with hypertrophy of calf muscles [4]. Thyroid gland may be normal in size [1,3,9] or diffusely enlarged [8] and thyroiditis as the cause of hypothyroidism was reported [1].

Our case had bilateral deafness since the age of six years, similar to the reported impaired hearing from early childhood in Atchayaram Nalini, et al. reported case [8]. The muscle hypertrophy may be generalized including; trapezius, shoulders and deltoid, biceps, gastrocnemius and the paravertebral muscles and were noticed bilaterally [1,5,8]. However our patient had only calf hypertrophy and large tongue as reported in by others [4,5]. Predominance of arm muscle hypertrophy alone was reported by N. V. Sundarachari, et al. [11] and of calf muscles of both lower limbs, was reported by Avik Chakraborty, et al [4]. The heart rate was noticed to be 54 – 60 beats/min (1, 4, 10). Patients are often misdiagnosed with myotonia, polymyositis, or muscular dystrophies [11].

The elevation of creatine phosphokinase (CPK) occur in 70 – 90% of patients with hypothyroidism and in thyroid myopathy will be very high; in some patients (10-100) times greater than the normal level [4,5,10]. In reported cases of Hoffman syndrome it was markedly raised to 1685 IU/L [10], 1800 IU/L [8], 2760 [5], 5360 IU/mL [11], however it reached 8284 IU/L in Deniz Tuncel, et al. case [1] and 14810 IU/L in Avik Chakraborty, et al [4]. Similar elevation was detected in our patient as well.

Nerve conduction test (NCT) in our case showed normal sensory and motor nerves as reported in a similar case reports [8,9]. Whereas the NCS of both upper and lower extremities were in normal limits with slightly prolonged F wave latencies in common peroneal nerves bilaterally [5].

The electromyography (EMG) study may reveal features suggestive of myopathy, neuropathy or mixed pattern [7]. Myopathic disorder of medial gastrocnemius, biceps brachii, rectus femoris and paraspinal muscles revealing low amplitude and short duration motor unit action potentials (MUAPs) with early recruitment was reported [9], and this simulate the finding of our case.

L-thyroxin at a dose 1.6 µg/kg/day increased gradually to 100 µg lead to decrease in calf muscle pseudo hypertrophy starting at 28 days with considerable reduction in two months, loss of muscle cramps and no symptoms at six months [3,8,9]. The calf circumference decreased by three cm over one month in Deniz Tuncel, et al. case [1]. Hearing had improved significantly on follow-up [3]. However treatment with 200 µg thyroxin per day showed significant improvement in patient condition [11].

Hoffmann's syndrome carries favorable prognosis once hormone replacement is instituted and most of the symptoms regress slowly with time, including the muscle enlargement. The follow-up values of TSH and CPK showed return to normal values within four to five months [9,11].

CONCLUSION

Hoffmann's syndrome is a rare case which may be confused with primary muscle disorders, and should be considered in the differential diagnosis of muscular pseudohypertrophy awareness of the condition and its management can resolve unnecessary misperception. In this treatable condition screening with simple thyroid profile is important

Table-1: Patients demographics and duration of symptoms in reported cases of Hoffmann syndrome

Author	Year	Country	Age (years)	Gender	Duration of symptoms
Fevzi ÖZTEKİN, et al. [5]	2005	Turkey	48	Male	Not specified
DenizTuncel, et al. [1]	2007	Turkey	24	Male	Four years
Praveen K. A. S, et al. [7]	2011	India	40	Male	Four months
Rudrajit Paul, et al.[12]	2011	India	58	Male	Three months
AmalAlkhotani[8].	2013	KSA	54	Male	Two years
N. V. Sundarachari, et al.[11]	2013	India	32	Male	One year
Nadia Shams, et al.[2]	3013	Pakistan	40	Male	Four years
AtchayaramNalini, et al.[3]	2014	India	35	Male	13 years
AvikChakraborty, et al.[4]	2014	Agartala	27	Male	Since childhood
Hemal MS Senanayake, et al.[9]	2014	Sri Lanka	39	Male	Since childhood
Mohammed NasirUddin, et al.[10]	2014	Bangladesh	30	Female	Two months
Current case	2014	Sudan	37	Male	One year

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