

Case Reports

Kocher-Debre-Semelaigne syndrome: Hypothyroid muscular pseudohypertrophy following athyreosis

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Introduction

Kocher-Debre-Semelaigne syndrome (KDSS) comprises muscular pseudohypertrophy and long standing moderate to severe hypothyroidism in children¹. The association of hypothyroidism with pseudohypertrophy of muscles was emphasized by Robert Debre and George Semelaigne in 1935 though this clinical condition had been initially reported by Emil Theodar Kocher in 1892². Severity of myopathy generally correlates with the duration and the degree of thyroid hormone deficiency³. The disease is more commonly seen among boys who are born to consanguineous parents⁴. The incidence of muscular pseudohypertrophy is less than 10% of those children with thyroid myopathy⁵.

The pathogenesis of the pseudohypertrophy in KDSS is not completely understood. The lack of thyroid hormone impairs many metabolic functions of the body including the musculoskeletal system. Impaired carbohydrate metabolism leads to glycogen accumulation in muscles while increased amounts of connective tissue and mucopolysaccharide deposits in the muscles also give the appearance of hypertrophy of muscles⁵. In this case report, we present a boy with KDSS following thyroid aplasia.

Case report

A four year old boy born to healthy, non-consanguineous parents from the estate community (Dickoya, Sri Lanka) was referred for evaluation of

short stature. His birth weight was 2.6 kg and he had neonatal jaundice from Day 7 to Day 15 following birth. Mother did not have thyroid disease. Nine month old male sibling was healthy.

The child had global developmental delay since birth which had not received medical attention due to parental ignorance. He also had cold intolerance, lassitude, lethargy, mental slowing, growth failure and a hoarse voice. There was no history of constipation and dietary history was insignificant. His gross and fine motor milestones were compatible with a two year old child and his speech development was at the level of a 1½ year old child. He had growth failure since infancy and weighed 12 kg (-2.5 SD). His height was 81 cm (-4SD). His height age was 1½ years and he had moderate to severe stunting (84%) by Waterlow classification. His predicted height was more than -3SD below the mid parental height and height velocity was low (7cm/year). The child had lumbar lordosis but no kyphoscoliosis. General examination found rough hair and skin texture, broad forehead with thick skin, coarse facial features, depressed nasal bridge, hypertelorism, puffed out lips and a large tongue (Figure 1).



Figure 1: Coarse facial features

*Permission given by parents to publish photograph

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He had a prominent muscular athletic build but with infantile proportions (Figure 2).



Figure 2: Athletic muscular build

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Neurological evaluation revealed decreased power in all four limbs involving both proximal and distal muscles (grade 3/5 to 4/5), diminished deep tendon reflexes with normal tone, intact sensory function and downward plantar reflexes. An ejection systolic murmur was heard at the base of the heart and apex beat was in the left 5th intercostal space in the mid-clavicular line. Serum cholesterol was elevated (8mmol/l). Roentgenogram of left wrist was compatible with a bone age of six months showing marked delay (Figure 3).



Figure 3: Roentgenogram of left wrist done at 4 years showing delay in bone age

Ultrasound scan of the neck showed thyroid aplasia without evidence of ectopic thyroid glands. 2D echocardiogram showed a pericardial effusion

without cardiomegaly or heart failure. Roentgenogram of the lumbosacral region showed anterior 'beaking' of lower lumbar and upper sacral vertebrae (Figure 4).



Figure 4: Anterior 'beaking' of lower lumbar and upper sacral vertebra

Hearing was found to be not affected after evaluation by the otorhinolaryngologist. Complete haemogram showed normal picture. The levels of serum calcium, serum phosphorus, and serum alkaline phosphatase were within normal limits. Serum aspartate transaminase was elevated (94 U/L). Serum triiodothyronine (T3) and thyroxine (T4) levels were significantly depressed (0.88mg/ml and 1.8µg/dl, respectively), and thyroid stimulating hormone (TSH) was elevated (44 IU/ml). Creatine phosphokinase (CPK) level was increased (256 U/L) despite treating the child with laevothyroxine for one week. Electromyography confirmed myopathy. A diagnosis of KDSS was made on the basis of the above findings and the child was started on laevothyroxine supplementation (50µg/day). Further clinic follow up was arranged at both tertiary and the regional hospitals to monitor child's growth and development, compliance and control of hypothyroidism.

Discussion

KDSS presents with hypothyroidism and muscular pseudohypertrophy and the disease is thought to be due to long standing hypothyroidism⁶. Hypothyroidism accounts for 5% of acquired myopathies⁷. The underlying aetiology for thyroid deficiency may vary from congenital (athyrosis, enzyme synthesis defects) to acquired (autoimmune) forms of hypothyroidism⁸. Athyrosis was established in this child by demonstration of thyroid aplasia in ultrasound imaging of neck region.

The pathogenesis of KDSS is poorly understood. It is postulated that prolonged thyroid hormone deficiency leads to impaired carbohydrate metabolism and glycogen accumulation in muscle. Increased amounts of connective tissue and mucopolysaccharide deposits are also increased in muscle tissues giving rise to the appearance of muscle hypertrophy⁹. Histology is non-specific and characteristic electromyogram findings along with mildly elevated CPK levels establish the diagnosis of KDSS in a child with hypothyroidism.

Dharaskar et al. (2007) first reported the association of pericardial effusion with KDSS¹⁰. Similar observations were noted in this child. The pseudohypertrophy was most striking in the limbs, and facial muscles as seen in other reported cases¹¹. Prognosis is good and the signs and symptoms of hypothyroidism as well as the muscular pseudohypertrophy revert back to normal following thyroxine supplementation¹². However, final height and mental development may be compromised. Parental ignorance and non-availability of medical care in remote villages may have resulted in hypothyroidism being missed in our patient and similar observations have been made in other case reports¹⁰. KDSS is rare in countries with screening programmes for hypothyroidism at birth but are not uncommon in countries where such routine screening programmes are not available so that the diagnosis of hypothyroidism may be delayed¹³.

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