Case Report

The Schwartz-Jampel syndrome: Case report and review of literature

Keivan Basiri, Farzad Fatehi[1], Bashar Katirji[2]

Isfahan Neurosciences Research Center, Alzahra Hospital, Department of Neurology, Medical School, Isfahan University of Medical Sciences, Isfahan, [1]Iranian Center of Neurological Research, Shariati Hospital, Tehran University of Medical Sciences, Tehran, Iran, [2]Department of Neurology, Neuromuscular Center and EMG Laboratory, University Hospitals Case Medical Center, Case Western Reserve University School of Medicine, Cleveland, Ohio, USA

Abstract

Schwartz-Jampel syndrome (SJS), first described in the United States in 1962, is a hereditary disorder characterized by facial dysmorphism and muscle stiffness. We describe the first case of a Persian 9-year-old boy with SJS and review the literature. The child had a short neck, blepharophimosis, flattened face, hypertrichosis of the eyelids, prominent eyebrows, high arched palate, low set ears, micrognathia, short stature, and skeletal deformities. He had proximal muscle hypertrophy, distal muscle wasting and generalized hyporeflexia. Bone X-ray revealed pseudofracture of humerus. Needle electromyography revealed continuous myotonic discharges at rest with no waxing and waning in all tested muscles. Based on clinical and electrodiagnostic findings, the diagnosis of SJS type 1B was made and procainamide was started which resulted in clinical improvement. The diagnosis of SJS should be suspected when a child presents with the triad of myotonia, facial dysmorphism and skeletal deformities.

Key Words: Carbamazepine, dysmorphism, myotonia, osteochondrodysplasia, Schwartz-Jampel syndrome

Address for correspondence:
Dr. Keivan Basiri, Department of Neurology, Alzahra University Hospital, Sofeh Street, Isfahan, Iran.
E-mail: basiri@med.mui.ac.ir
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INTRODUCTION

The first case of Schwartz-Jampel syndrome (SJS) or chondrodystrophic myotonia was explained in 1962 by Oscar Schwartz and Robert S. Jampel. Although it was initially described in the United States, it has also been reported worldwide. Herein, we describe the first Persian case of SJS ever reported in the literature which was misdiagnosed as a metabolic disorder for a long period of time. The description of this case as well as the review of the literature should help in better and earlier recognition of this rare musculoskeletal disorder.

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CASE REPORT

A 9-year-old boy referred to neuromuscular clinic from orthopedic service for evaluation of generalized muscles and joints contractures. Pregnancy, labor and delivery of the patient were uncomplicated. His mother appreciated contractures of limbs from 6th month after birth that progressed slowly over the years. He had no cognitive impairment. There was no family history of similar disorder. He was diagnosed with Morquio's syndrome despite lack of other mucopolysaccharidosis signs such as corneal clouding, glaucoma, and organomegaly and normal laboratory tests including

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negative urine test for glycosaminoglycans and negative enzyme analysis for sulfatases.

On physical examination, he had a short neck, blepharophimosis, flattened face, hypertrichosis of the eyelids, prominent eyebrows, high arched palate, low set ears and micrognathia [Figure 1a]. He also had a short stature for age and several skeletal deformities including kyphosis, coxa valga, significant limitations of joints range of motion including fixed contractures of hips, knees and elbows [Figure 1b]. On neurological examination, there was proximal muscle hypertrophy, distal muscle wasting and generalized hyporeflexia. Bone X-ray revealed pseudofracture of humerus. Electromyography revealed continuous myotonic discharges at rest with no waxing and waning in all tested muscles of upper and lower limbs.

Based on facial and skeletal abnormalities, muscle stiffness and contractures, electrodiagnostic findings and normal laboratory data; diagnosis of chondrodystrophic myotonia or SJS was made and procainamide was started which resulted in mild reduction of muscle stiffness. DNA studies were not consented by the child's parents because of lack of effective treatment for the disorder.

DISCUSSION

SJS was first described in a brother and sister with myotonic myopathy and blepharophimosis. Giedion *et al.*,[1] classified SJS in three types. Type 1A is usually recognized in childhood and exhibits only moderate bone dysplasia, and type 1B is similar to 1A but manifests at birth with more prominent bone dysplasia, while type 2 is the most severe and uncommon form with extremely high mortality in the neonatal period. Neonatal SJS (type 2), also known as Stuve-Wiedemann syndrome, is characterized by dysmorphism and muscle disorder in infancy, and is a more severe phenotype with genetically distinct mutation in the LIFR gene on chromosome 5p13.[2] In view of the age of onset in early infancy and the patient survived into adolescence, our patient diagnosis would best fit the SJS type 1B.

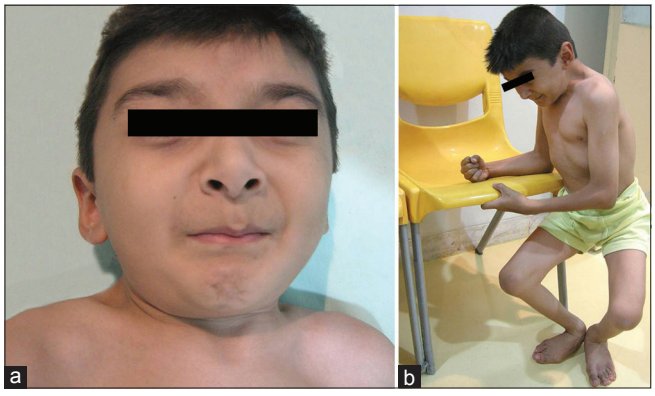

Figure 1: A 9-year-old boy with Schwartz-Jampel syndrome. Note the short neck, blepharophimosis, flattened face, hypertrichosis of the eyelids, prominent eyebrows, high arched palate, low set ears, micrognathia (a) and short stature, coxa valga, kyphosis and joints contractures at the hips, knees and elbows (b)

SJS is characterized by short stature in 90% of patients, clinical myotonia in 85%, puckered-small mouth in 80%, muscle hypertrophy in 70%, fixed facies in 55%, bone abnormalities in 45%, raised muscle enzymes in 45%, hip dysplasias in 40%, blepharophimosis and blepharospasm in 32.5%.[3] Skeletal features include spinal deformities, fragmenting of femoral epiphysis, widened metaphysis, joint contractures, osteoporosis and delayed bone age.[4] Other less common reported features include high pitched voice,[5] bilateral carpal tunnel syndromes,[6] and malignant hyperthermia.[7] Creatine kinase and aldolase is normal or slightly elevated. Nerve conduction studies are normal. On needle electromyography, continuous muscle activity at rest, with high frequency spontaneous repetitive potentials occur which persist during sleep and during general anesthesia.[8] Moreover, discharges similar to the myotonic discharges that do not wax and wane are often recorded.[8] Muscle biopsy shows nonspecific myopathic changes.[4] Spinal X-rays reveals kyphosis and other skeletal deformities.

SJS is mostly transmitted as autosomal recessive with reports of dominant inheritance.[8] SJS results from mutations in the HSPG2 gene in chromosome 1p34-36.1,[9] which encodes perlecan, a major component of basement membranes, causing membrane hyper-excitability.[10] Perlecan is also found in cartilage[11] and bone marrow stromal cells,[12] and plays an important role in cartilage development and bone fracture repairs.[13] As a result, defects in production of perlecan explain skeletal abnormalities and pseudofractures seen in SJS.

The combination of facial dysmorphism and skeletal deformities, muscle stiffness and contractures, and myotonic discharges without waxing and waning are characteristic for SJS and render it difficult to be confused with other disorders. Almost all reported cases in the literature were diagnosed based on these clinical and electrophysiological findings. The differential diagnosis of SJS includes conditions presenting with cramp and stiffness (Stiff person syndrome, Isaac's syndrome), myotonic disorders (Congenital myotonic dystrophy, myotonic dystrophy, myotonia congenita, paramyotonia congenital), muscular dystrophies (Becker dystrophy, Duchenne dystrophy, congenital muscular dystrophy), congenital myopathies, channelopathies, mucopolysaccharidosis

(Morquio's syndrome), Ehlers-Danlos Syndrome, malignant hyperthermia, Blepharospasm and Stuve-Wiedemann syndrome.

Searching the world literature indexed in Pubmed, we found a total 129 reported cases since the first description in 1962. We also searched Pubmed with different combinations of keywords including: "Myotonia and facial Dysmorphism", "myotonia and blepharophimosis", "myotonia and micrognathia", "myotonia and skeletal malformations", "myotonia and skeletal deformities" "myotonia and bone dysplasia" and "myotonia and short stature" and found 9,12,4,1,5,7 and 10 articles, respectively. All of the articles referred to SJS except for two cases with channelopathy and two others with myotonic dystrophy. When we combined the triad "myotonia, facial dysmorphism and skeletal deformities" in our search, all reports included the SJS.

Treatment of SJS is mainly symptomatic. One of the goals is to decrease the abnormal muscle activity that causes the stiffness and cramping. Anticonvulsants such as carbamazepine and phenytoin, and antiarrhythmic drugs like mexiletine and procainamide may alleviate myotonia. Non-pharmacologic modalities such as physiotherapy, warming, massage, warming-up prior to exercise and gradual stretching may also be helpful. Myectomy, levator resection, and lateral canthopexy provides an excellent, long-lasting relief of blepharospasm and eyelid anomalies.[14] Application of Botulinum toxin-A to orbicularis oculi muscle for the treatment of blepharospasm could be considered as an alternative to levator resection, and lateral canthopexy.[15]

We conclude that the triad of "myotonia, facial dysmorphism and skeletal deformities" is highly specific for the diagnosis of the SJS in children and DNA testing for the HSPG2 gene in chromosome 1p34-36.1 is often confirmative.

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