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CASE REPORT / OLGU SUNUMU

Magnetic Resonance Spectroscopy in Sjögren-Larsson Syndrome

Sjögren-Larsson Sendromunda Manyetik Rezonans Spektroskopi

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ABSTRACT

Sjögren-Larsson syndrome (SLS) is a rare neurocutaneous disease showing an autosomal recessive transmission due to a lack of fatty acid aldehyde dehydrogenase. Spastic diplegia or triplegia, mental retardation and congenital lamellar ichthyosis are the major findings of the disease. The syndrome may be accompanied by various eye and teeth features, skeletal system anomaly, speaking defects, hypertelorism and epilepsy. A 9-month male patient has been hospitalized for convulsion and flaking on body. The patient history showed that flaking skin thickening and peeling was started at the birth, and he suffered a right-side focused seizure when he was three month-old and he was treated with phenobarbital and carbamazepine upon the epilepsy diagnosis. Wide ichthyosis, hypertelorism and bilateral simian line were observed in the physical examination. Bilateral punctuate lesions in cornea, pigment epithelial atrophy in the right eye and esotropia in the left eye have been determined during the eye examination. An epiteliform anomaly has been observed in the left hemisphere by electroencephalography. In brain magnetic resonance imaging (MRI), an increase in cerebral-cerebellar brain parenchyma and T1-T2 relaxation time and in the signal in corpus callosum (delayed myelination) have been determined. With the observation of the white matter in centrum semi oval using brain MRI spectroscopy, signs of a sphingolipid peak at 1.3 ppm have been observed. An SLS diagnosis has been proposed upon clinical and laboratory observations. We want to emphasize on the fact that in epilepsy cases with ichthyosis, SLS should be considered.

Key words: Magnetic resonance spectroscopy, Sjögren-Larsson syndrome, epilepsy, ichthyosis, child

ÖZET

Sjögren-Larsson sendromu (SLS), yağ asidi aldehid dehidrogenaz enzim eksikliği sonucu gelişen, otozomal resesif geçiş gösteren nadir bir nörokutanöz hastalıktır. Spastik dipleji veya tetrapleji, mental retardasyon ve konjenital lameller ihtiyozis hastalığın major bulgularıdır. Sendroma çeşitli göz ve diş bulguları, iskelet sistemi anomalileri, konuşma defektleri, hipertelorizm ve epilepsi de eşlik edebilmektedir. Dokuz aylık erkek hasta havale geçirme ve vücudunda pullanma şikâyetleri ile getirildi. Özgeçmişinde, ciltteki pullanmalarının doğumundan itibaren olduğu ve zamanla deride kalınlaşma ve soyulmaların başladığı, ilk kez üç aylıkken sağ tarafa lokalize havale geçirdiği ve epilepsi tanısı ile fenobarbital ve karbamazepin kullandığı öğrenildi. Fizik muayenesinde ciltte yaygın ihtiyozis, hipertelorizm ve bilateral simian çizgisi vardı. Göz muayenesinde korneada bilateral punktat lezyonlar, sağ gözde pigment epitel atrofisi ve sol gözde ezotropia tespit edildi. Elektroensefalografide sol hemisferde epileptiform anomali izlendi. Beyin Manyetik Rezonans (MR) incelemesinde serebral-serebellar beyin parankiminde ve T1-T2 relaksasyon süresinde artış ve korpus kallozumda sinyal artışı (gecikmiş miyelinizasyon) saptandı. Beyin MR spektroskopide sentrum semiovaledeki beyaz cevhere yönelik yapılan incelemede 1,3 ppm'de sfingolipid pikini içeren bulgular izlendi. Klinik ve laboratuar bulgularıyla SLS tanısı kondu. Bu vaka dolayısıyla epilepsi ile birlikte ihtiyozisi olan vakalarda SLS'nin de düşünülmesi gerektiğini vurgulamak istedik.

Anahtar kelimeler: Manyetik rezonans spektroskopi, Sjögren-Larsson sendromu, epilepsi, ihtiyozis, çocuk

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INTRODUCTION

Sjögren-Larsson syndrome (SLS), is a rare neurocutaneous disease showing an autosomal recessive transmission due to a lack of fatty acid aldehyde dehydrogenase [1]. Approximately 200 cases have been declared from the definition of the syndrome. Most of the cases are from Sweden, and the incidence in the North of that country is 2.7-10.2/100.000 [1,2].

With the study of this case, we aimed to emphasize on the fact that in rare epilepsy cases with ichthyosis, SLS cases shall be considered.

CASE REPORT

A 9-month male patient has been hospitalized in our clinic for convulsion and flaking on body. The patient went through flaking skin thickening and peeling at the birth and the patient history showed that lamellar ichthyosis diagnosis was established from the dermatology department they applied. He suffered a right-side focused seizure when he was three month-old and he was treated with phenobarbital and carbamazepine upon the epilepsy diagnosis.

The patient history also showed that he was born by caesarian section at twenty eight weeks; with a weight of 1800 grams and that he was under phototherapy due to jaundice. The mental and motor development was normal. There was no particularity in the family history. In physical examination, his height was 66 cm (10 percentile), his body weight was 7.6 kg (10-25 percentile), and his head circumference was 44 cm (10 percentile). Wide ichthyosis has been observed in scalp, nape, arms, chest, shoulders, legs, face, and abdomen, palm and sole. Hypertelorism and bilateral simian line have been observed (Figure 1). Hemogram, biochemical and urinary analyses, coagulation tests and levels of thyroid hormone, B12 vitamin and folate were normal in laboratory analyses. The tandem mass study result was normal. Bilateral punctuate lesions in cornea, pigment epithelial atrophy in the right eye and esotropia in the left eye have been determined during the eye examination. No anomalies except of a slight kyphoscoliosis have been observed in the skeletal survey. An epiteliform anomaly has been observed in the left hemisphere by electroencephalography. In brain magnetic resonance imaging (MRI), an increase in cerebral-cerebellar brain parenchyma and T1-T2 relaxation time and in the signal in corpus callosum (delayed myelination) have been determined (Figure 2). With the observation of the white matter in centrum semi oval using brain MRI spectroscopy, signs of a sphingolipid peak at 1.3 ppm have been observed (Figure 3). Sjögren-Larsson Syndrome diagnosis has been proposed upon clinical and laboratory observations for the patient. He is still under observation, squams are present in some area of his skin and the convulsions are kept under control using a double antiepileptic treatment.

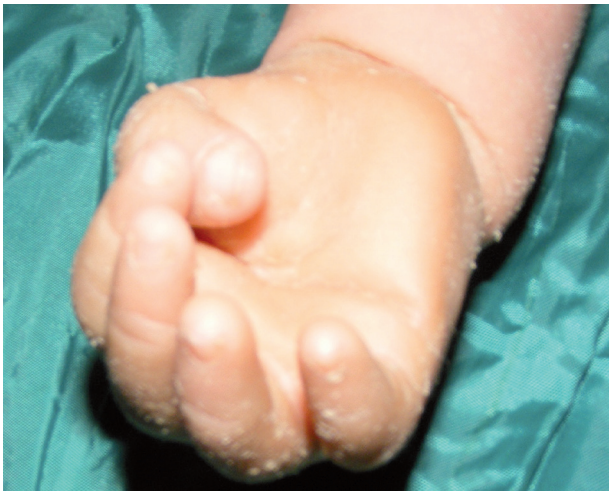

Figure 1. Wide ichthyosis and squams

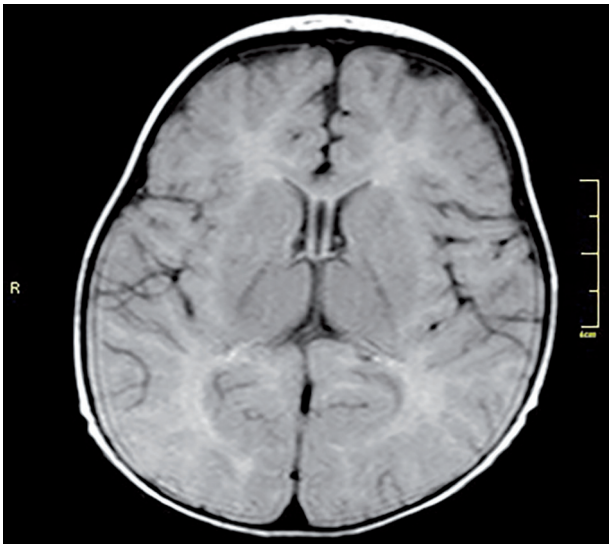

Figure 2. Brain MRI images showing increase in cerebral-cerebellar brain parenchyma and T1-T2 relaxation time and in the signal in corpus callosum (delayed myelination)

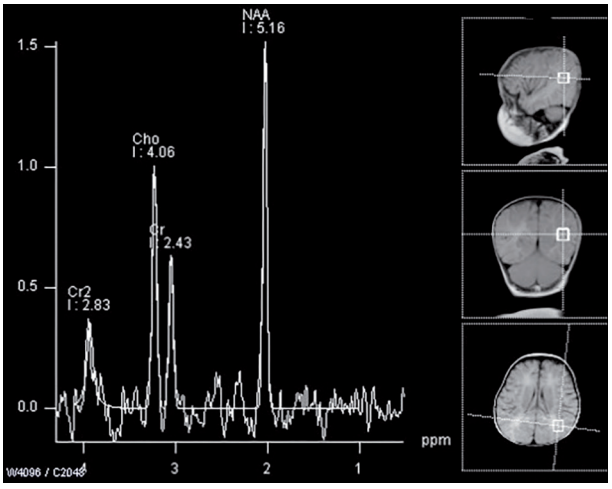

Figure 3. MRI spectroscopy image of white matter in centrum semi oval showing sphingolipid peak at 1.3 ppm

DISCUSSION

The biochemical and metabolic defect observed in this syndrome is not well known. However, a lack of NAD+ oxidoreductase enzyme of the fatty alcohol responsible for the oxidation of the fatty alcohol to the fatty acid in skin fibroblast cultures and peripheral blood leucocytes has been determined. The accumulating fatty alcohols or its metabolic products are supposed to modify the epidermal lipid composition that has a water retainer property and thus may play a role in the pathogenesis [2]. Enzymatic studies have not been performed on our patient due to technical difficulties. However, the diagnosis has been established as SLS considering the clinical and radiological observations of the patient.

Spastic diplegia or triplegia, mental retardation and congenital lamellar ichthyosis are major findings of the disease. In addition to this, punctuate epithelial erosions in the surface, white glistening dots (pathognomonic for this syndrome), pigment degeneration in the retina, some observations in the eye such as blepharitis, conjunctivitis, presence of simian line, short height, teeth anomalies, kyphosis, scoliosis and skeletal system anomalies such as metaphysial dysplasia with small irregular epiphysis, speaking defects, hypertelorism, aminoaciduria and epilepsy may appear with this syndrome [1-3]. In our case; congenital lamellar ichthyosis, epilepsy, hypertelorism, bilateral simian line and slight kyphoscoliosis were observed. Bilateral punctuate lesions in cornea, pigment epithelial atrophy in the right eye and esotropia in the left eye have been determined during the detailed eye examination but no glistening dots have been observed in the macula.

Ichthyosis is present everywhere in the body but is more marked in flexural regions of the body and in lower abdomen [4]. In most patients, ichthyosis appears at birth and immediately after birth and looks like lamellar ichthyosis [2]. The skin lesions of our patient correspond to this particularity.

Some findings such as spasticity, mental retardation, epilepsy, delayed or affected speaking, increase in deep tendon reflexes, bilateral positive Babinski reflex and hyperextension in articulations may observed with this syndrome. The spasticity may appear before age of three and is more pronounced in lower extremities. Mental retardation may be at a medium or heavy level and display a progressive evolution (in 70% of the patients the intelligent quality level is <50%). In SLS, epilepsy may be observed in 30-50% of the patients [2,3]. In our case, the mental and motor development was normally observed. He has an epileptiform anomaly which was present in the left hemisphere and kept under control using a double antiepileptic treatment.

Nonspecific observations can be obtained with computer assisted tomography [3]. In the computer-assisted brain tomography of SLS patients, hypo dense area have been observed in white matter particularly marked in the frontal lobe [3,5]. In brain MRI, white matter disease characterized with demyelination or delayed myelination [5]. Moreover, micro ventricle, porencephaly, corpus callosum agenesis, cerebral cortical atrophy have been mentioned in some publications [3]. In our case, an increase in cerebral-cerebellar brain parenchyma and T1-T2 relaxation time and in the signal in corpus callosum (delayed myelination) have been determined in brain MRI.

Protein magnetic resonance spectroscopy observations have shown an abnormal peak at 1.3 ppm conform to the accumulation of long chain fatty alcohol in the periventricular white matter (especially around posterior and frontal horns) [3,6]. In our case, signs of a sphingolipid peak at 1.3 ppm have been observed in brain MRI spectroscopy.

There is still no curative treatment for SLS and leukotriene synthesis inhibitors are considered as

potential therapeutic agents for SLS patients [7]. In SLS patients, the diets for the reduction of long chain fatty acids intake are mostly useless; however, a low fat content diet focused on the reduction of medium-length chain fatty acid intake may be efficient when started at early stage of childhood and may result in skin lesions recovery [2,7]. Our patient was received the diets with reduction of long chain fatty acids and double antiepileptic treatment, and his squams are present in some area of his skin and the convulsions are kept under control.

In conclusion, SLS is a rare disease and should be considered in epilepsy cases which were along with ichthyosis. This cases should be evaluated with neuroradiological examination such as brain MRI and protein MR spectroscopy.

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