



Case Report

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Kearns Sayer Syndrome- A Case Report

Reshmi Mishra¹

¹ Pokhariput F-103, Kokila Garden, Phase-2, Bhubaneswar, Odisha, India

Abstract

Kearns-Sayre syndrome (KSS) is a rare mitochondrial disease was first described in 1958. The characteristic triad is age of onset less than 20 years, progressive external ophthalmoplegia, pigmentary retinopathy, The prevalence rate of KSS is nearly 1–3 per 100 000 individuals. Here, we report a rare case of a 11-year-old male with KSS.

Keywords: Kearns-Sayres syndrome, CPEO (chronic progressive external ophthalmoplegia with myopathy), Elevated CSF Protein and lactate.

INTRODUCTION

Kearns Sayer Syndrome (KSS) is a rare mitochondrial disease, characterized by the triad of, age of onset less than 20 years, progressive external ophthalmoplegia, and retinitis pigmentosa [1]. Its prevalence is nearly 1-3 per 100000 population [2]. This disease may also be associated with conduction defects of the heart, ataxia, a CSF protein of more than 100mg/dl, elevated CSF lactate, myopathy, hypothyroidism, and other endocrinological disorders. At present, no definite disease-modifying therapy is available for the treatment of this disorder.

The case is being reported for its rarity and reviewing the recent updates in the management of this condition.

CASE REPORT

An eleven-year-old boy presented with progressive nyctalopia, drooping eyelids and restriction of movements of the eyes that was more marked during the evening hours. These symptoms progressively increased in severity over a period of 3-4 years. There was no significant history in the past except for blood transfusion for severe anemia at three years. The workup for the possible cause of anemia done then was noncontributory.

He was underweight for his age with 20 kilograms at 11 yrs of age and short in stature, with a height of 115cm, which was less than the 10th percentile. Neurologically, the child had bilateral ptosis, restriction of movement of the eyeball, and the upward movement being most affected. The tone and deep tendon reflexes were normal, muscle power on both the lower limb was 4/5 in the proximal groups, in the distal being normal and the plantar response was flexor in both sides. The other systemic examinations were normal.

A Neostigmine challenge test was done to rule out ocular myasthenia gravis was inconclusive. The fundoscopy examination suggested the presence of retinitis pigmentosa. Investigations revealed hemoglobin 7.5 gm%, to ascertain the cause of anemia certain other tests were done. The peripheral smear showed poikilocytes, ovalocytes, macroovalocytes and schistocytes, but the iron profile, vitamin B12, and folic acid levels were within normal limits. The fetal hemoglobin electrophoresis, thyroid function test, parathyroid hormone level, electrolytes, and serum calcium revealed no abnormalities. We could find a very high level of LDH and CPK MB. CSF study showed high protein and lactate levels, i.e., 106mg/dl and 3.8mmol/lit. The ECG, echocardiography, and MRI of the brain were also normal. With the disease onset before the age of 20 years, external ophthalmoplegia, retinitis pigmentosa, high protein, and lactate content in the CSF, the diagnosis of Kearns Sayer Syndrome was reached. The child was discharged with Co-Enzyme Q (3) and antioxidant, with advice to follow up for a periodic cardiology check-up.

DISCUSSION

Kearns Sayer Syndrome is a rare cytological disorder affecting the mitochondria. Mitochondrial respiratory chain dysfunction leads to ATP depletion and increased oxidative stress. Classically, the disease onset is before the age of 20, which, along with progressive ophthalmoplegia and retinitis pigmentosa, makes the characteristic triad of this syndrome [4].

*Corresponding author:

Dr. Reshmi Mishra

Pokhariput F-103, Kokila
Garden, Phase-2,
Bhubaneswar, Odisha, India
Email: docreshmis@gmail.com

Mitochondria make up nearly 60% of the cell volume in the eye muscles [5]. Subnormal functioning of the mitochondrial respiratory chain gives rise to slow and progressive weakness of the ocular muscles, thereby restricting eye movements and ptosis. This chronic progressive external ophthalmoplegia (CPEO) rarely causes diplopia. The visual acuity is usually normal; however, optic atrophy and retinal involvement have been reported [6].

A case series reported by Khambatta S *et al.* highlighted skeletal muscle weakness ranging from mild to extreme debility [7]. The child who presented to us had a gradual onset of muscular weakness with predominant involvement of the proximal group. Bilateral facial weakness, dysarthria, nasal regurgitation, dystonia, myoclonic jerks, and even cerebellar ataxia have been noted in those affected with this disease. Short stature and endocrinopathies like hypothyroidism, parathyroid dysfunction, Addison's disease has been reported in patients of KSS [8]. Berio *et al.* cited a deficiency of growth hormone in this disorder [9,10]. Our patient also had short stature, although a specific cause could not be elucidated.

Cardiac manifestation includes pre-excitation in the form of Wolff-Parkinson-White syndrome, heart blocks, arrhythmias, cardiomyopathy, etc. may occur. Echocardiograms and ECGs were the mainstays of investigation for their detection [11].

Elevation of protein and lactate in the cerebrospinal fluid requires lumbar puncture and CSF analysis. Neuroimaging is neither sensitive nor specific enough for diagnostic. However, as some patients develop a leukoencephalopathy, an MRI of the brain should be performed. Hyperintensities on fluid-attenuated inversion recovery (FLAIR) sequences in the brain stem, globus pallidus, thalamus, and white matter of the cerebrum and cerebellum are the possible MRI abnormalities. Cardiovascular magnetic resonance (CMR) has recently been found to be of value in the early detection of cardiovascular manifestation in KSS. A late gadolinium enhancement in the basal inferolateral wall helps differentiate KSS from other mitochondrial myopathies. In cases of clinically suspected KSS, Next-generation sequencing (NGS) of the mitochondrial DNA genome in peripheral blood leukocyte samples to identify deletions is the preferred diagnostic modality [11]. In the case of the highly suspected case with blood test negative, muscle mtDNA can be sequenced [12].

CONCLUSION

In the absence of an established disease-modifying therapeutic agent, early diagnosis and timely supportive treatment can be the basis of improving the prognosis. In endocrinopathies, hormonal replacement therapy, cardiac pacemaker placement for patients with cardiac conduction blocks. Patients with ptosis and diplopia may benefit from surgery. Cochlear implants can be used for patients with sensorineural hearing loss [13,14].

Conflicts of interest

The authors declared no conflict of interest.

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