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Case Report

Kearns-Sayre syndrome presenting as epilepsia partialis continua in a child

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Abstract. We report a case of Kearns-Sayre syndrome in 10-year-old boy, who presented with epilepsia partialis continua. Laboratory investigations revealed an elevated creatine kinase, serum lactate and cerebrospinal fluid protein. The subject was treated with multiple antiepileptic medications and megavitamins and the seizures decreased over a period of 2 wk.

Keywords: Kearns-Sayre syndrome, epilepsia partialis continua

1. Introduction

Kearns-Sayre syndrome (KSS) is characterized by pigmentary retinopathy, opthalmoparesis, cerebellar ataxia, myopathy, conduction blocks and elevated cerebrospinal fluid (CSF) protein. It is attributed to deletions in the mitochondrial deoxyribonucleic acid [1]. The exact incidence of KSS is not known [2]. An epilepsia partialis continua (EPC) is a type of partial status epilepticus with motor manifestations for more than 1 h restricted to one body part and recurring at regular intervals. The incidence of EPC is estimated to be at 1 per million populations, which itself is a rare entity [3]. We report a rare case of epilepsia partialis continua secondary to KSS.

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2. Case report

A 10-year-old boy presented with convulsions of 4 days duration. Seizures were focal confined to right side, lasting for 2-3 h. He had 3-4 attacks per d. After day 5 of convulsions the child had persistent right focal convulsions involving right upper limb predominantly hand, around 7 to 8 episodes per day, each lasting for 2 to 3 h without any loss of consciousness. There was no significant family history. Development of the child was normal with no significant past illness. He was born at term following anormal vaginal delivery. No family history suggestive of weakness, deafness, headache, and epilepsy. On examination, his anthropometry was within normal limits. He had bilateral ptosis with restriction of all extraocular movements with right sided hemi paresis (power 4/5-Medical Research Council grade). He had dysmetria, ataxia and dysdiadochokinesia. Fundus shows pigmentary degeneration in peripheral retina.

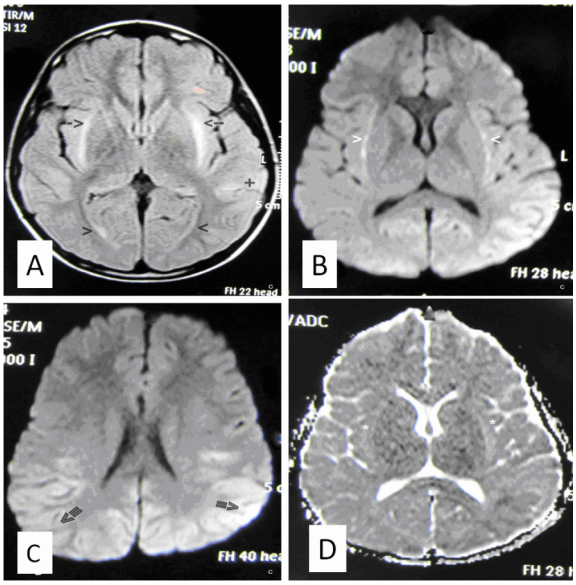

Fig. 1. Axial fluid attenuation and inversion recovery image at the level basal ganglia shows there is hyperintense signal involving the bilateral external capsule (→) optic radiation (black >) and cortex of the posterior part of left temporal lobe (+) (A); Diffusion weighted images shows restriction at the external bilateral capsules (white >) and parietooccipital lobes (=>) (B, C); apparent diffusion coefficient image shows low apparent diffusion coefficient values at the bilateral external capsules (*) (D).

Based on the above clinical findings intracranial space-occupying lesion like tuberculoma, neurocysticercosis or brain tumor was suspected. T2-weighted magnetic resonance imaging (MRI) of brain shows hyper intense signal changes involving the bilateral external capsule, optic radiation and cortex of the posterior part of left temporal lobe (Fig. 1). Fluid attenuation and inversion recovery (Fig. 1A) and diffusion weighted images shows restriction at the bilateral external capsules and parietooccipital lobes (Figs. 1B and 1C). Apparent diffusion coefficient image shows low apparent diffusion coefficient values at the bilateral external capsules (Fig. 1D). His serum creatine phosphokinase (964 U/L) and arterial lactate (7.8 mmol/L) were increased. Serum ammonia (41 μmol/L), electrocardiography, electrocardiogram (ECG), and arterial blood gas analysis were normal. Lumbar puncture showed increased CSF protein (140 mg/dL) and lactate (5.2 mmol/L). CSF glucose was normal without any cells. Electroencephalography (EEG) shows slow waves (2–3 Hz, 100–300 μV) on left hemisphere (C4, T4, and P4). Visual evoked potentials were normal. Muscle biopsy was normal. We suspected KSS, based on cerebellar ataxia, ptosis with external opthalmoplegia, retinitis pigmentosa, increased arterial lactate and increased CSF protein. We have not done genetic test for KSS due to non-affordability. He was treated with injection lorazepam 0.1 mg/kg two times, later loading dose of phenytoin 20 mg/kg followed by 8 mg/kg/d in two divided doses. Later he was given injection phenobarbitone, loading dose of 20 mg/kg followed by 6 mg/kg/d in two divided doses. He was not responding for above medicines, so we started injection levetiracetam 30 mg/kg loading followed by 30 mg/kg/d and increased to maximum dose of 60 mg/kg/d over 5 days duration. Later added oral carbamazepine was started at 10 mg/kg/d then gradually increased to 30 mg/kg/d over 10 d period. He later received tablet clobazam 10 mg once in 12 h. His seizures gradually decreased over a period of 15 days with above medications. Patient also received megavitamins, cornitine and coenzyme Q. After 6 mo of follow up, his power on right side improved (Medical Research Council grade - 4+/5), had persistent cerebellar ataxia and external opthalmoplegia

3. Discussion

Primary mitochondrial diseases are a group of clinically and genetically heterogeneous disorders that result in decreased energy production of the respiratory chain in the form of adenosine triphosphate. In primary mitochondrial disease, the organ systems requiring the most adenosine triphosphate to function properly present with evidence of energy failure. Therefore, the energy-demanding nervous system is frequently affected, especially in childhood. Brain and muscle, along with vision and hearing, are typically involved, bringing that child to the attention of the child neurologist [4].

Epilepsy is the main childhood manifestation of mitochondrial encephalopathy. Epilepsy may be the presenting feature of mitochondrial disease. Common findings in epilepsy that should raise the suspicion of mitochondrial disease include EPC, myoclonus, and status epilepticus, especially if the seizures are explosive in onset [5]. Seizures are quite common in mitochondrial disease, with a reported incidence of 35–60% in patients with biochemical or molecularly confirmed mitochondrial disease. Patients with epilepsy and mitochondrial disease have mixed seizure types. One review of patients with confirmed

respiratory chain defects revealed a spectrum of epilepsy phenotypes ranging from Ohtahara syndrome to Landau-Kleffner syndrome, with seizure types ranging from generalized to partial [6]. Another review of patients with seizures and mitochondrial disease, epilepsy phenotypes ranged from neonatal refractory status epilepticus with multi organ failure to infantile spasms, myoclonic epilepsy, recurrent status epilepticus, and EPC [7].

KSS is a rare disorder usually appears before 20 yr of age, presents with muscle weakness, ptosis, and opthalmoplegia. Involvement of the central nervous system can manifest as encephalopathy, ataxia, deafness, cognitive deficits and night blindness. EPC has been reported in mitochondrial disorders like Alpers disease, mitochondrial encephalopathy with lactic acidosis and stroke like episodes, and others like cerebral neoplasia, cortical dysplasia, infections and vascular lesions. KSS presenting as epilepsia partialis continua has not been reported yet.

Our patient presented before the age of 20 with epilepsy, cerebellar ataxia, retinitis pigmentosa, and external ophthalmoplegia. Investigations showed an increase in creatine phosphokinase, lactate and CSF protein. We diagnosed KSS based on triad of onset before 20 yr of age, progressive external ophthalmoplegia, and pigmentary retinopathy, in addition to cerebellar syndrome with elevation of CSF protein [8].

MRI of the brain in KSS is reported to show sub cortical white matter lesions with involvement of thalamus, basal ganglia, brainstem with cerebral and cerebellar atrophy [9]. This was however, not seen in the present case. Atypical MRI findings in this case will be helpful in creating awareness of variable phenotype of KSS. Muscle biopsy may reveal ragged red fibers in KSS. ECG shows conduction blocks with prolonged PR interval. Muscle biopsy and ECG were however, normal in this child probably due to early stage of disease and child may develop these changes later. EEG was normal in our child as it was done after convulsions subsided. This is the limitation of our report as bedside EEG facility was not available.

Management is predominantly supportive, consists of physiotherapy, coenzyme Q, carnitine and other megavitamins. EPC is treated with antiepileptic drugs. KSS should be suspected in any child presenting with epilepsia partialis continua with cerebellar signs, opthalmoplegia, and retinitis pigmentosa.

In conclusion, mitochondrial disorders including KSS should be suspected in any child presenting with EPS.

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