Case Report

Kearns – Sayre Syndrome

A. M. Raja*, Siddharam*, S. Janti*, Adnan Matheen**, C. Charanya**

* Assistant Professor, **Post Graduate, Dept. of Ophthalmology, Chettinad Hospital & Research Institute, Chennai, India.

Dr.A.M.Raja did his M.B.B.S from Stanley Medical college and finished his M.S. Ophthalmology from Regional Institute of Ophthalmology, Madras Medical college (2nd oldest eye institute in the world). He finished his fellowship in Medical Retina and Retinal lasers. He has also finished fellowship in phacoemulsification and is currently working as Assistant Professor in Chettinad Hospital & Research Institute.

Corresponding author - Dr. A.M.Raja (amraja83@gmail.com)

Abstract

The Kearns-Sayre syndrome is a rare genetic disorder caused by mitochondrial myopathy due to mutations in mitochondrial DNA and typicallydevelops before the age of twenty. Clinical triad of Kearns-Sayre syndrome are chronic Progressive External Ophthalmoplegia (CPEO), salt and pepper like Pigmentary Retinopathy and Cardiac blocks. KSS prognosis is related to the number of tissues affected and the severity of the alterations. In this article we report a patient who presented with clinical features suggestive of Kearns-Sayre syndrome.

Key Words: Mitochondrial Myopathy, CPEO, Pigmentary Retinopathy and Cardiac blocks

Chettinad Health City Medical Journal 2014; 3(1): 29 - 31

Introduction

Kearns-Sayre syndrome is a rare neuromuscular disorder first described by Thomas P. Kearns and George P. Sayre in 1958. Incidence is 3/100000 live births and is a rare genetic disorder caused by mitochondrial myopathy due to mutations in mitochondrial DNA and typically develops before the age of twenty. Clinical triad of Kearns-Sayre syndrome were Chronic Progressive External Ophthalmoplegia (CPEO), salt and pepper like Pigmentary Retinopathy and Cardiac blocks.

Case Report

19 year old male came to ophthalmology outpatient department with complaints of drooping of eye lids and difficulty in moving both eyes for the past one year, six episodes of syncope in past five months duration.There was no history of diplopia, ataxia and deafness.On examination both eyes vision was 6/60 with pin hole improvement to 6/24. Both eyes lids showed severe ptosis with poor Levetor Palpebrae Superioris and restricted extraocular movements suggestive of Chronic Progressive External Ophthalmoplegia (CPEO) (Fig 1). Conjuntiva, Cornea, Iris, Lens were normal. Intraocular pressure was within normal limits. Fundus showed pigmentary retinopathy in macula (Fig 2). Electroretinogram showed reduced photopic and normal scotopic response (Fig 3). On auscultation pansystolic murmur (2/6) was noted. Electrocardiogram showed third degree atrioventricular block with an atrial rate of 100 per minute and a ventricular rate of 37 per minute (Fig 4). Echocardiogram shows a dilated left ventricle with an ejection fraction rate of 63%. Patient has CPEO, Pigmentary retinopathy and Cardiac blocks, so we came to the diagnosis of Kearns- Sayre Syndrome.

Fig 1 : A - shows bilateral severe ptosis and B – shows external ophthalmoplegia

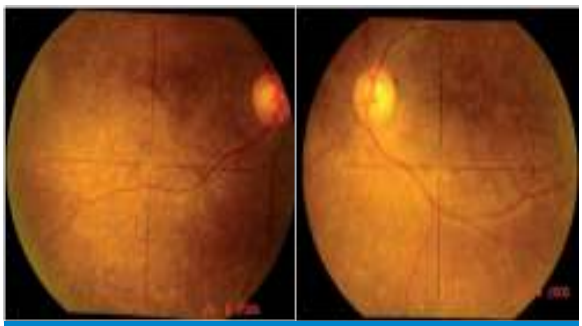

Fig 2 : Both eyes showed pigmentary retinopathy in posterior pole

Discussion

Kearns-Sayre syndrome, a rare neuromuscular disorder was first described by Thomas P. Kearns and George P. Sayre in 1958.Incidence is 1-3/100000 live births[1,2]. The Kearns-Sayre syndrome is a genetic disorder caused by mitochondrial myopathy due to mutations in mitochondrial DNA involved in oxidative phosphorylation for energy production.

Mitochondrial DNA contains many genes for normal function but deletion removes 4,997 nucleotides, which includes twelve mitochondrial genes in Kearns – Sayre syndrome. Deletions of mitochondrial DNA result in impairment of oxidative phosphorylation and a decrease in cellular energy production. Regardless of which genes are deleted, all steps of oxidative phosphorylation are affected. Tissues with high energy demand such as muscle and nervous system are particularly vulnerable to mitochondrial dysfunction, a consequence of deletions, rearrangements or other mutations in mitochondrial DNA[3,4,5]. Triad of Kearns-Sayre syndrome are Chronic Progressive External Ophthalmoplegia (CPEO), salt and pepper like Pigmentary Retinopathy and Cardiac blocks. Ptosis is the first sign in Kearns-Sayre syndrome. Other systemic involvements are deafness, ataxia, syncope, renal failure, seizure, dementia, short stature, hypocalcemia and diabetes[6,7,8,9]. The cardiac manifestations of Kearns- Sayre Syndrome are the most important aspects of the disease for determining the prognosis. Manifestations of cardiac disease occur in 57% of patients with Kearns-Sayre Syndrome, including syncopal attacks, heart failure and cardiac arrest[10,11,12]. Kearns-Sayre Syndrome is diagnosed by extra ocular muscle biopsy which shows the ragged-red cells (red fibers torn) due to intramuscular accumulation of abnormal mitochondria and it is specific for the diagnosis of mitochondrial myopathies[6,7,8]. Increased amount of protein (>1g/l) in cerebrospinal fluids in CSF analys is also specific for Kearns-Sayre syndrome[6,7]. There is no specific treatment for Kearns-Sayre syndrome. Co enzyme Q10 was tried in certain myopathy cases. Cardiac blocks are managed with cardiac pacemakers and ptosis corrected by crutch glasses (Fig 5).

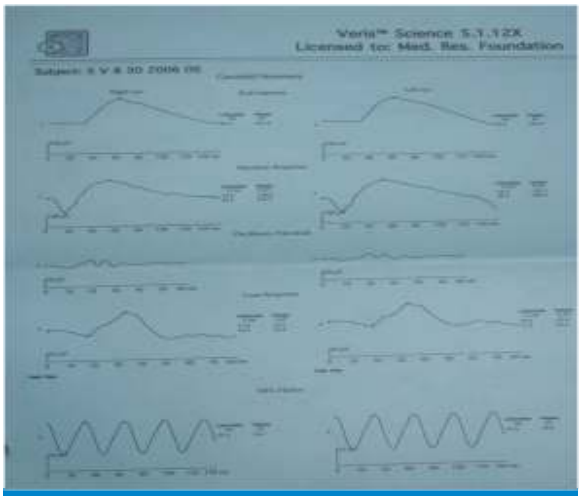

Fig 3 : Electroretinogram showed reduced scotopic and normal photopic response

Conclusions

Awareness of the nature of components of the syndrome led us to early recognition of the systemic complications and plan appropriate referral and management. KSS prognosis is related to the number of tissues affected and the severity of the alterations. The disturbances in the cardiac conduction system are responsible for high morbidity and mortality of the disease.

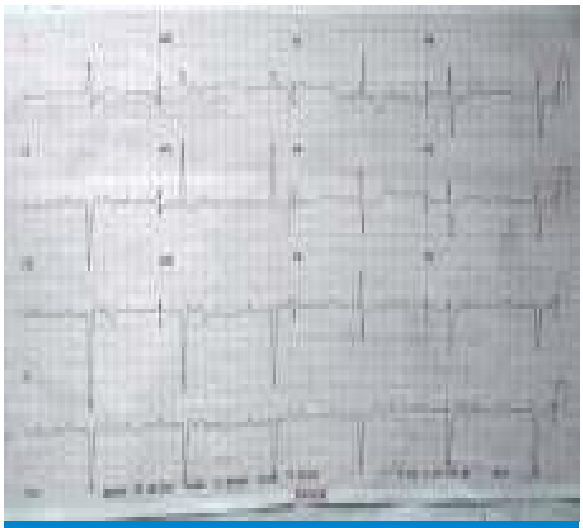

Fig 4 : ECG shows third degree atrio - ventricular block

Fig 5 : Bilateral ptosis corrected by crutch glasses

References

1) Kearns TP, Sayre GP. Retinitis pigmentosa, external ophthalmoplegiaand complete heart block: unusual syndromewith histologic study in one of two cases. Arch Ophthalmol 1958;60:280-289.

2) Nasseh IE, Tengan CH, Kiyomoto BH, Gabbai AA. Doenças mitocondriais. Rev Neurociências 2001;9(2):60-69.

3) Gerbitz KD obermeir –kusserB .ZEIRS Z mitochondrial myopathies divergence of genetic deletions biochemical defects and genetic syndromes J Neurol 1990;273-5:10

4) ZevianiM, MoraesCT, Di Mauro S.Deletions of mitochondrial DNA in aernes-sayresyndrome.Neurology 1998: 1525-32

5) BrockingtonM, AlsanjariN, Sweeney MG, Kaernes-sayre syndrome associated with mitochondrial DNA deletionor duplication, a molecular genetic and pathological study. J NeuroalSci 1995; 131: 78-87

6) Jack j Kanski Brad Bowling Clinical Ophthalmology : Seventh edition; A systematic approach; Chronic Progressive External Ophthalmoplegia: 853-854

7) American Academy of Ophthalmology; Retina and VitreousSection - 12 ; Kearns- Sayre Syndrome; 2011-2012 : 275-276

8) Albert Jakobie's Principles and Practice of Ophthalmology ; Third edition ; Retina and Vitreous ; Kearns- Sayre Syndrome: 33-99

9) Myron YANOFF and Jays DUKER Ophthalmology third edition; Retina and Vitreous; Kearns- Sayre Syndrome: 10-32

10) Young TJ, Shah AK, Lee MH, Hayes DL: Kearns Sayre Syndrome: A case report and reviewof cardiovascular complications. Pacing Clinical Electrophysiol. 2005;28:454-457

11) Schwatzkoff BB, Frenzel H, Losse B, Borgreffe M, Toyka KV, et al.: Heart involvement inProgressive external ophthalmoplegia (Kearns Sayre syndrome) Electrophysiologic,hemodynamic and morphologic findings. Journal of Cardiology. 1986;75:161-169

12) Sachdev P, Elliot PM, McKenna WJ:Cardiovascular complications of neuromusculardisorders. Curr Treatment Options Cardiovasc Med 2002;4:171-179

Diabetes is after women's heart!

In one of the largest studies of its kind published in Diabetologia (Diabetologia, May 2014 DOI: 10.1007/s00125-014-3260-6), a metanalysis & systematic review was done on the data obtained from more than 850,000 subjects over a period of 50 years with particular reference to relationship between diabetes and heart disease. It was found that diabetic women have three times greater risk of developing coronary heart disease (CHD) than their non-diabetic counterparts; in diabetic men, the risk of CHD is two-times higher than in non-diabetic men. Taken overall, women have 44% increased risk of CHD compared to diabetic men. If these findings are confirmed, screening women for pre-diabetes and a more stringent follow-up of diabetic women is necessary to prevent CHD in them.

- Dr. K. Ramesh Rao