Case Report

Senior Loken syndrome with Atypical Retinitis Pigmentosa: a rare manifestation of rare disease

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ABSTRACT

Senior Loken syndrome is an autosomal recessive condition characterized by combination of nephronophthisis and retinal degeneration. The earliest presenting features include polyuria and polydipsia secondary to impaired urinary concentrating ability. Nephronophthisis progresses to end stage kidney disease (ESKD) during second decade. The treatment of choice for ESKD due to nephronophthisis is renal transplantation. Retinal lesions are variable ranging from severe infantile onset retinal dystrophy to more typical retinitis pigmentosa. There is a spectrum of other features associated with this condition including skeletal, dermatological and cerebellar anomalies. Till date very few cases have been reported due to lack of awareness of this rare condition. Here, we report a case of Senior loken syndrome with atypical retinitis pigmentosa in a 14-year-old boy.

Keywords: Atypical retinitis pigmentosa, Nephronophthisis, Senior loken syndrome

INTRODUCTION

Senior loken syndrome (SLS) is a rare syndrome of retinopathy and nephronophthisis and was first described by Senior et al and Loken et al separately in 1961. Nephronophthisis is the frequent cause of end stage kidney disease in first three decades of life. Senior Loken syndrome accounts for 10-15% of all cases of nephronophthisis. Senior loken syndrome is an autosomal recessive syndrome included under the category of ciliopathies, a class of genetic diseases that occur due to primary ciliary dysfunction.

The earliest presenting features include polyuria and polydipsia secondary to impaired urinary concentrating ability. Retinal lesions are variable ranging from severe infantile onset retinal dystrophy to more typical retinitis pigmentosa. There is a spectrum of other features associated with this condition including skeletal, dermatological and cerebellar anomalies. Here we report a case of Senior loken syndrome with atypical retinitis pigmentosa.

CASE REPORT

A 14-year-old male child presented to us with a history of facial puffiness for 6 days, swelling of lower limbs for 6 days, decreased urine output for 3 days. On detailed history, he complained of polyuria and nocturia in the past 1 month. Further questioning revealed history of progressive decreased vision in the dark since 1 month. Child was 3rd born to a second degree consanguineously married couple. There was no history of similar complaints in other family members. On examination, child’s height was 141 cm (-3 and -2 SD) weight was 30 kg and BMI was 15.15 (-3 and -2 SD).

Further examination revealed bilateral puffiness of eyes and facial puffiness with bilateral pitting pedal edema till ankle joints. Skin was dry. Child was hypertensive.
Systemic examination was unremarkable. On fundoscopic examination child had features suggestive of atypical retinitis pigmentosa.

Laboratory investigation revealed renal dysfunction. Initial blood urea: 337 mg/dl, serum creatinine: 17.8 mg/dl and Urine routine showed 10-15 pus cells, 8-10 RBCs, 3+ albumin, and granular casts. CBC revealed child was anemic with haemoglobin of 8.5g/dl. ABG was suggestive of metabolic acidosis. USG abdomen revealed Grade III medical renal disease (MRD) with cystitis with no obvious cystic lesion.

Hence diagnosis of senior Loken syndrome was made considering the age of presentation, ophthalmoscopic findings and renal parameters. Child was subjected to haemodialysis and given supportive treatment.

**DISCUSSION**

Senior Loken syndrome is a rare syndrome of retinopathy and Nephronophthisis. It was first described by Senior et al and Loken et al separately in 1961.1,2 Nephronophthisis is the most frequent cause of end stage kidney disease in first two decade of life.3 Senior Loken syndrome accounts for 10-15% of all cases of Nephronophthisis.4

Renal involvement occurs in the form of nephronophthisis and is characterised by chronic tubulointerstitial nephritis that progresses to end stage kidney disease (ESKD) during 2nd decade of life. Mutation in the 9 genes (NPHP 1-9) are responsible for nephronophthisis.5 There are three clinical variants of Nephronophthisis according to the age of onset of ESKD.6 Infantile form is associated with blindness in infancy, hypertension and death from renal failure before the age of 10. It is caused by mutation in the NPHP 2 gene which is located on chromosome 9q31. It is associated with extrarenal features which include hypertension, situs inversus and ventricular septal defect.5,6 Adolescent form is caused by mutation in NPHP3 gene located on chromosome 3q22 in which ESKD occur early in adulthood and histological form is similar to juvenile form.5,6 Juvenile form is the most common type of nephronophthisis and it accounts for 5-10% of all cases of ESKD. It is caused by mutation in 8 different genes (NPHP 1, 2, 3, 4, 5, 6, 7, 8, 9).7 NPHP 1 is the common gene which is responsible for juvenile nephronophthisis. It is characterised by late onset slow progression of renal disease and mild ocular manifestation.

Renal involvement is mild and asymptomatic. The earliest signs are decreased urinary concentration ability which leads to polyuria, polydipsia and renal loss of sodium by 4-6 year of age.7 Proteinuria, hematuria are absent or minimal. BP remain normal until development of chronic kidney disease which invariably occur before 20 years of age.8 USG findings may be normal, or they may show an increased echogenicity of renal parenchyma, poor corticomedullary differentiation, small kidney and medullary cysts. However, the lack of medullary cysts at presentation does not rule out diagnosis of juvenile nephronophthisis.9

Nephronophthisis should not be confused with autosomal dominant polycystic kidney disease (ADPKD) which is characterised by bilateral multiple renal cysts or Medullary cystic kidney disease (MCKD) which shares features of nephronophthisis. However, unlike nephronophthisis ADPKD and MCKD are inherited in an autosomal dominant pattern and progress to ESKD at later age.10

Retinal lesion in SLS are variable ranging from severe Leber’s amaurosis to a more typical Retinitis pigmentosa.11 Leber’s amaurosis is a severe form of retinal dystrophy which leads to blindness in infancy, nstagramus and diffuse atypical retinal pigmentation and pallor of optic disc with early and complete extinction of Electoretinogram (ERG). Retinitis pigmentosa is characterised by bone spicule pigmentation of retina and presents initially with night blindness which gradually progress to day time blindness.

The diagnosis of SLS is based on typical clinical presentation of a clinical interstitial nephritis and retinopathy in 2nd decade of life. There are very few case reports of SLS due to lack of awareness of this rare condition.

Though the case we report here did not show any cystic changes in the kidney, the typical age of presentation, renal symptoms and ophthalmic findings are consistent with SLS which led to the diagnosis of SLS in the absence of genetic analysis.

**CONCLUSION**

SLS must be considered in any patient who present with renal failure in first decade of life with retinitis pigmentosa. Detailed ophthalmic evaluation must be done in all cases presenting with renal failure. Similarly, children presenting with retinitis pigmentosa early in the life must have regular assessment of renal parameters and renal ultrasound. All siblings of child with senior Loken syndrome must be screened as it is inherited autosomal recessively. There is no specific treatment for this condition. Renal transplantation is the preferred therapy. However regular monitoring of BP, restriction of high protein diet intake can delay the progression to ESKD and thus need for renal transplantation.

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