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Case Report

Laurence-Moon-Bardet-Biedl Syndrome: Fortuitous Diagnosis in an Atopic Child

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ABSTRACT

Laurence-Moon-Bardet-Biedl syndrome (LMBBS) is a rare autosomal recessive disorder with clinical and genetic heterogeneity. It is characterized by rod-cone dystrophy, postaxial polydactyly, central obesity, mental retardation, and hypogonadism. It is one of the few rare genetic diseases which can be diagnosed easily on a clinical basis and does not rely on laboratory investigations and genetic analysis for the diagnosis. We report a case of an adolescent boy who presented to us primarily for atopic dermatitis, who had typical features of LMBBS which had been overlooked till he came to our hospital.

Keywords: Hypogonadism, Polydactyly, Retinitis pigmentosa

INTRODUCTION

Laurence-Moon-Bardet-Biedl syndrome (LMBBS) is a rare and autosomal recessive ciliopathic disorder with high incidence in consanguineous communities. It is characterized by early onset retinitis pigmentosa, central obesity, mental retardation, post-axial polydactyly, hypogonadism, and structural or functional abnormalities of the kidney. Congenital heart block, brachycephaly, deafness, and dental anomalies are few other features reported in association with the cardinal features. Early diagnosis is important but the full spectrum of the cardinal clinical features is found in only 40–45% cases.[1]

CASE REPORT

A 14-year-old boy presented to us with complaints of dryness and itching all over body for the past 2–3 years with winter aggravation. Examination revealed generalized xerosis, follicular accentuation, hyperlinearity over palms, perioral facial pallor, and Denny Morgan folds congruous with atopic dermatitis. He was also overweight (BMI – 28.2; height – 163 cm; and weight – 75 kg) and had acanthosis nigricans and hexadactyly [Figures 1 and 2] in both feet and left hand and micro genitalia (penile length – 4 cm). Secondary sexual characters were absent. As the features suggested possibility of a genetic syndrome, we probed further which revealed that he had been diagnosed as having retinitis pigmentosa for 5 years of age. He also had a history of polydipsia and polyuria which were unaddressed till date. He had a delayed onset of speech at 4 years and the parents felt that he lagged behind in learning. Motor and other developmental milestones were achieved normally. There was no history of consanguinity or another person afflicted with

same phenotype in the family. Psychiatric evaluation revealed an I.Q. of 60 (mild intellectual disability). Endocrinological evaluation for suspected hypogonadism revealed low serum testosterone (20 ng/dL) and normal leutinizing hormone, follicular stimulating hormone, estradiol, and prolactin levels for his age and sex. His lipid profile was deranged and HbA1c was 5.89 (pre-diabetic). Electrocardiogram, echocardiogram and audiometry were normal. Ultrasonography showed smaller left kidney and bilateral small testes. His 24 h urinary output was 4.5–5 L and he was referred to a nephrologist for further evaluation. Based on the classical phenotype, we made the diagnosis of LMBBS and the parents were advised regarding regular multidisciplinary follow-up.

DISCUSSION

The first cluster of cases with features of retinal dystrophy, cognitive impairment, and spastic paraparesis was described by Laurence and Moon in 1866 and was named Laurence Moon syndrome (LMS). However, in the 1920s, Georges Bardet and Arthur Biedl described additional features of central obesity and post-axial polydactyly with absence of paraparesis and coined the term LMBBS.[2] Physicians have always been divided over separate existence of these two entities, but Moore *et al.* suggested that LMS and Bardet-Biedl syndrome (BBS) are two spectrums of the same entity with overlapping features.[3]

So far, 19 genes (BBS1-BBS 12) have been identified responsible for the BBS spectrum while the gene responsible for LMS is PNPLA6.[4] Multiple mutations make genetic testing a tedious and expensive process, with limited usefulness in the diagnosis. The proteins coded by these genes affect the ciliary transport (hence the nomenclature ciliopathies) which explains the involvement of multiple organs.

Clinical criteria have been suggested by Beales *et al.* for facilitating the diagnosis [Table 1].[5] Post-axial polydactyly/syndactyly and brachydactyly are usually the earliest manifestations evident at birth. Mild-to-moderate delay in milestones, mainly speech is seen in many cases and IQ evaluation reveals mild-to-moderate mental retardation. Central obesity is also a prominent feature developing in early childhood. Ocular manifestations of the rod-cone dystrophy start developing by late first decade and are characterized by progressive diminution in night vision, decreased visual acuity, and may progress to complete blindness at a very young age. Our patient was diagnosed with classic findings of retinitis pigmentosa at 5 years and despite being started on treatment, he still had some vision loss. Structural as well as functional renal changes are observed in most LMBBS individuals and account for significant comorbidity, making it prudent for early involvement of nephrologist. Hypogonadism is invariably seen in all affected individuals and an endocrinologist should be involved to prevent the long term adverse effects of the decreased circulating hormones. Metabolic syndrome and diabetes mellitus are seen to be frequently associated with LMBBS necessitating strict vigilance.

The overall prognosis of the disease varies, with end stage renal disease and blindness, being the most common morbidities. The patients are otherwise of a happy disposition as compared to the gravity of their illness. The investigations advisable are summarized in [Table 2].

Although our patient had earlier been seen by different specialists, the diagnosis had been missed. He had presented to us with features suggesting atopic dermatitis but the watchful eye of the resident helped us to reach the diagnosis. Through this case, we want to reinforce the age old adage of importance of thorough clinical evaluation. LMBBS is one of the few rare genetic diseases which are easily diagnosable clinically and does not rely on expensive genetic analysis.

Table 1: Modified diagnostic criteria by Beales *et al.*

Primary features	Secondary features
Rod-cone dystrophy*	Speech disorder/delay*
Polydactyly*	Strabismus/cataracts/astigmatism
Obesity	Brachydactyly/syndactyly
Learning disabilities	Developmental delay
Hypogonadism in males*	Polyuria/polydipsia (nephrogenic diabetes insipidus)*
Renal anomalies*	Ataxia/poor coordination/ imbalance
	Mild spasticity (especially lower limbs)
	Diabetes mellitus
	Dental crowding/hypodontia/small roots/high arched palate
	Left ventricular hypertrophy/ congenital heart disease
	Hepatic fibrosis

Presence of four primary features or three primary features plus two secondary features is considered diagnostic
*Features seen in our patient.

Table 2: Investigations advisable in patient with LMBBS.

Baseline	Blood pressure recording
	Electroretinogram/visually evoked responses
	Abdominal ultrasonography
	ECG and Echocardiogram
	Serum hormone levels
	Renal function tests including complete urinalysis
	Metabolic screening
	IQ assessment
Six monthly	Blood pressure monitoring
	Urine analysis
	Serum creatinine/blood urea

LMBBS: Laurence-Moon-Bardet-Biedl syndrome

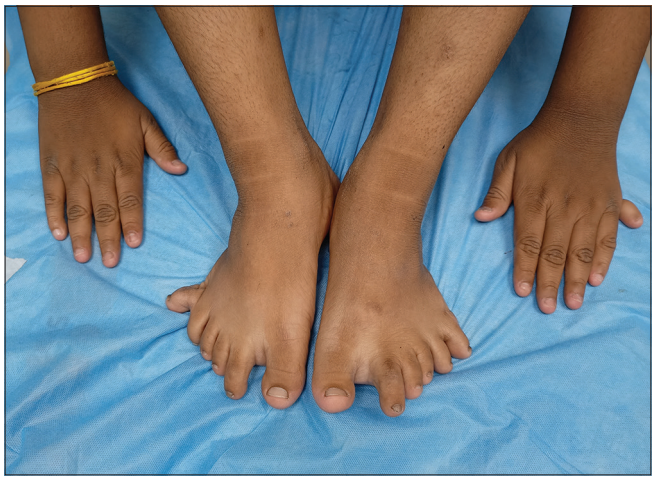

Figure 1: Hexadactyly in the left hand and both feet.

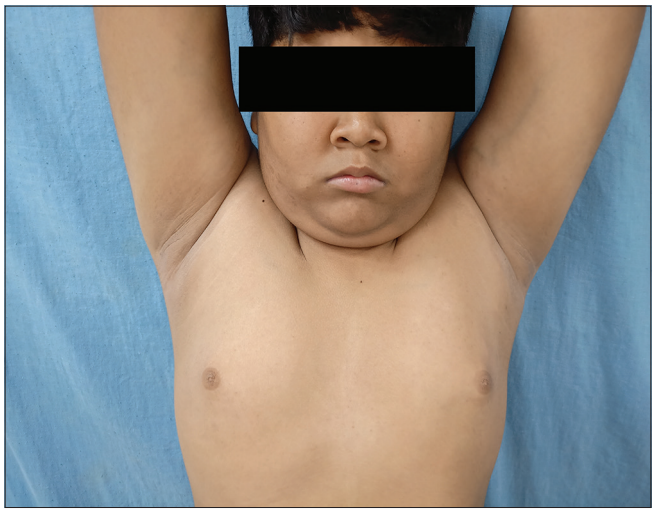

Figure 2: Acanthosis nigricans with absence of axillary hair.

CONCLUSION

Thorough history taking and clinical examination should not take a backseat in this modern era of investigations.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Prosperi L, Cordella M, Bernasconi S. Electroretinography and diagnosis of the Laurence-moon-Bardet-Biedl syndrome in childhood. J Pediatr Ophthalmol 1977;14:305-8.
2. Madireddi J, Acharya V, Suryanarayana J, Hande HM, Shetty R. Bardet-Biedl syndrome: Multiple fingers with multiple defects! BMJ Case Rep 2015;2015:bcr2015211776.
3. Moore SJ, Green JS, Fan Y, Bhogal AK, Dicks E, Fernandez BA, *et al*. Clinical and genetic epidemiology of Bardet-Biedl syndrome in Newfoundland: A 22-year prospective, population-based, cohort study. Am J Med Genet A 2005;132:352-60.
4. Forsythe E, Beales PL. Bardet-Biedl syndrome. In: Gene Reviews. Seattle, WA: University of Washington; 2003.
5. Beales PL, Elcioglu N, Woolf AS, Parker D, Flinter F. New criteria for improved diagnosis of Bardet-Biedl syndrome: Results of a population survey. J Med Genet 1999;36:437-46.

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