Asian Journal of Pharmaceutical and Health Sciences
www.ajphs.com

A rare case report on bardet-biedl syndrome

S.Manasa*[1], M.Alekhya[1], G.Ramya Bala Prabha[2], T.Rama Rao[3]

1 Pharm D students, CMR College of Pharmacy, Kandlakoya, Medchal, 501401, Telangana.
2 Assistant professor, Department of Pharm D, CMR College of Pharmacy, Kandlakoya, Medchal, 501401, Telangana.
3 Principal, Department of pharm D, CMR College of Pharmacy, Kandlakoya, Medchal, 501401, Telangana.

ARTICLE HISTORY

Received: 14.09.2021

Accepted: 22.11.2021

Available online: 30.12.2021

DOI:

10.5530/ajphs.2021.11.25

Keywords:

Bardet biedl, Retinitis pigmentosa, Consanguineous, Ciliopathic

***Corresponding author:**

Phone : +91 - 9121876894
Email : manasasamala1999@gmail.com

ABSTRACT

The Bardet-Biedl syndrome (BBS) is a rare autosomal recessive disorder that primarily affects children born to consanguineous marriages. Cone-rod dystrophy, polydactyly, obesity, learning difficulties, hypogonadism in males, renal abnormalities, nystagmus, speech disorders, developmental delay, polyuria/polydipsia, ataxia, and poor coordination/clumsiness are all common symptoms of this condition. This syndrome has been related to twenty-one different loci (BBS1-BBS21). BBS is usually not diagnosed until the patient begins to exhibit the visual impairments that are hallmark of rod-cone dystrophy, unless the diagnosis is suspected based on antenatal imaging demonstrating polydactyly and structural kidney abnormalities. The current treatment for Bardet Biedl syndrome is symptomatic, with a focus on intensive care of diabetes, hypertension, and metabolic syndrome to reduce the secondary effects of these illnesses on susceptible organ systems already compromised by BBS, particularly the eyes and kidneys. The patient was admitted with known complaint of bardet biedl syndrome, chronic kidney disease stage 4, hypothyroidism and with chief complaints of pedal oedema, shortness of breath, decreased urine output, pedal oedema, abdominal distention, facial puffiness. Symptomatic treatment is prescribed along with hemodialysis (thrice a week).

INTRODUCTION

Laurence and Moon described a family of four siblings suffering from retinitis pigmentosa, obesity, spastic paraparesis, and cognitive difficulties in 1866[1]. LaurenceMoonBardetBiedl syndrome was coined after Bardet and Biedl independently reported on other similarly affected people who also had post-axial polydactyly, but there was controversy as to whether they were the same entity. Laurence Moon and Bardet Biedl syndromes were later separated, however mutations in known BBS genes have been found in families with both syndromes . It is now often referred to as BBS. Bardet-Biedl syndrome is a rare autosomal recessive disorder that usually affects children born from consanguineous marriages. Cone-rod dystrophy, polydactyly, obesity, learning difficulties, hypogonadism in males, renal abnormalities, nystagmus, speech disorders, developmental delay, polyuria/polydipsia, ataxia, and poor coordination/clumsiness are all common symptoms of this condition. The initial signs among these patients appear in the first ten years of life, with poor night vision being the most common[2].The syndrome has a 1;1,60,000 probability of occurring. India has reported only about 15 cases. The disease incidence is substantially greater in some populations with a high level of consanguinity or those that are geographically isolated, with disease incidence of 1 in 13,000 in isolated people of Newfoundland and 1 in 17,000 live births in Kuwait[3].

CASE PRESENTATION

A 24 year old female presented chief complaints of shortness of breath, decreased urine output, pedal oedema, abdominal distention, facial puffiness and she was previously diagnosed as “bardet biedl syndrome” with chronic kidney disease stage IV with primary hypothyroidism and vitamin D3 deficiency. She was born to the consanguineous parents. She is neither diabetic nor hypertensive. The patient is anemic. Normal developing milestones. She attained menarche at 13 years of age and her menstrual cycle was regular (3/30) , no dysmenorrhea. The patient is normal till 12 years of age, later she gained weight and noticed progressive decline in vision in both eyes, presently she developed retinitis pigmentosa with impaired vision since 5 years.

On examination, she has obesity, polydactyly (right and left lower limb) (FIG.1), wide spaced eyes (FIG.2), wide nasal bridge,

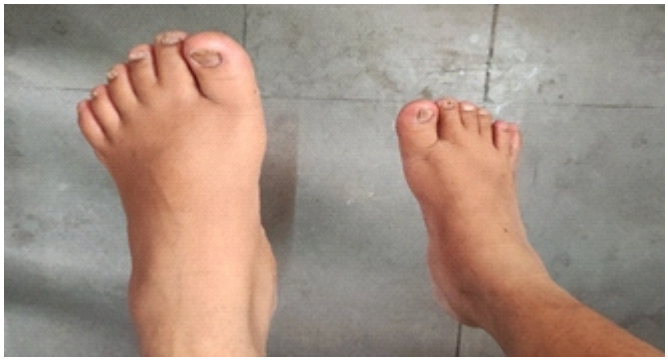

Fig. 1. : Showing Polydactyly for both lower limbs

The patient vital signs : blood pressure-140/90mmHg , pulse rate-110 beats per min, decreased carbon dioxide saturation (24.2), glucose random blood sugar was normal.

Laboratory findings of haemoglobin was 6.8g/dl,W.B.C 7.89 [10^3U/L], RBC 2.32 [10^6U/L], neutrophils (3.68[10^3/UL]), lymphocytes 0.92 [10^3/UL], monocytes 0.42 [10^3/UL], eosinophils 0.08[10^3/UL], platelet 161[10^3/UL].total serum protein 7.28 gm%, serum albumin 2.66 gm% , blood urea 317.5 gm%, serum creatinine 14.3 mg%, Total serum bilirubin 0.26mg%, serum electrolytes: sodium 139 mEq/L ,potassium 6.2 mEq/L, chloride 116mEq/L. Urine examination revealed that presence of pus cells 3-4 , epithelial cells 2-3, R.B.C 1-2, urine is pale yellow in colour and has acidic reaction.

Ultrasound scan of abdomen has revealed cholelithiasis and colour Doppler study revealed urinary bladder was partially distended,both kidneys are normal in size and with grade II echotexture, vitamin D3-9.54 microgram/ml, leutinising hormone 7.42, prolactin 14.3, FSH 10.76 and prothrombin time-test 15.3 sec, control 13 sec, I.N.R 1.17. Thyroid stimulating hormone 15.106. Brain CT showed hypodensity of cerebral white matter. she had a few episodes of seizures (3-4 episodes of generalized clonic tonic seizures). She was undergoing hemodialysis 3 times a week.

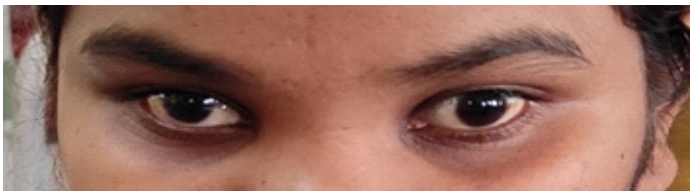

Fig. 2. : Wide spaced eyes

There are no proven effective treatments for vision deterioration, either to prevent or to ease it. Spectacles had been recommended in the past since our patient had low eyesight, but she had now entirely lost her vision. As she is having anemia (6.8gm/dl) she was treated with T.IFA(335mg) ,decreased urine output is treated with lasix (20mg), she had few episodes of seizues and she was treated with Inj.levipil (500mg), hypothyroidism with T.thyronorm (50mcg), vitamin D3 deficiency with T.calcitriol and vitamin supplements.As the patient is in a stage 4 chronic kidney disease undergoing hemodialysis with oral administration of nodosis(sodium bicarbonate).

CASE DISCUSSION

This syndrome has been linked to twenty-one distinct loci (BBS1-BBS21). The genes mostly code for proteins that are either part of the core BBSome complex (BBS1, BBS2, BBS4, BBS5, BBS7, BBS8, and BBS9) or part of a BBS chaperone complex (BBS6, BBS10, and BBS12), which are important for the BBSome stabilisation and control. Other genes code for

MODIFIED DIAGNOSTIC CRITERIA

PRIMARY FEATURES FOUR FEATURES ARE REQUIRED TO BE PRESENT OF: ROD-CONE DYSTROPHY POLYDACTYLY OBESITY LEARNING DISABILITIES HYPOGONADISM IN MALES RENAL ANOMALIES OR THREE PRIMARY PLUS TWO SECONDARY FEATURES ARE REQUIRED OF: SECONDARY FEATURES SPEECH DISORDER/DELAY STRABISMUS/CATARACTS/ASTIGMATISM BRACHYDACTYLY/SYNDACTYLY DEVELOPMENTAL DELAY POLYURIA/POLYDIPSIA ATAXIA/POOR COORDINATION/IMBALANCE MILD SPASTICITY DIABETES MELLITUS DENTAL CROWDING/ HYPODONTIA/SMALL ROOTS/HIGH ARCHED PALATE LEFT VENTRICULAR HYPERTROPHY/CONGENITAL HEART DISEASE HEPATIC FIBROSIS
Beales et al modified diagnostic criteria propose that a clinical diagnosis requires either four primary findings or three primary and two secondary features. BBS summarises the primary and minor clinical characteristics, as well as their frequency [5].

proteins involved in BBSome activation and localization (ARL6), BBSome entrance into cilia (BBS17), or are related with the BBSome complex (BBS14). Some of the proteins' roles aren't completely understood. BBSome is a stable protein complex that regulates ciliary protein trafficking and acts in the formation and maintenance of the primary cilium, a structure that is widely expressed and highly conserved throughout evolution[4].

BBS is usually not diagnosed until the patient begins to exhibit the visual impairments that are hallmark of rod-cone dystrophy, unless the diagnosis is suspected based on antenatal imaging demonstrating polydactyly and structural kidney abnormalities. [5]

The current treatment for Bardet Biedl syndrome is symptomatic, with a focus on intensive care of diabetes, hypertension, and metabolic syndrome to reduce the secondary effects of these illnesses on susceptible organ systems already compromised by BBS, particularly the eyes and kidneys (6). For the majority of patients, weight management is a never-ending battle (7). Some people choose bariatric surgery (8) or antiobesity medication, but for the vast majority of patients, dietary advice is the safest and most successful way to lose weight (9). Hormone replacement therapy can be used to treat the anterior pituitary gland's poor functional capability, which causes slow metabolism, poor growth, and infertility. Levothyroxine can help to boost the body's metabolism, resulting in less fatigue and hair loss. retinal dystrophy is the first symptom that arises before the age of 10 years but affects almost all patients below the age of 20 years . Glasses can be used to treat this, and regular ophthalmologist visits are recommended . Our patient is treated symptomatically with standard treatment.

CONCLUSION

The clinical features of Bardet-Biedl syndrome cause significant morbidity and mortality. A geneticist, opthalmologist, nephrologist, endocrinologist, psychologist, dietician, speech and language therapist, nurse, and a patient support group representative should all evaluate the patient on a yearly basis. This provides a place to go for regular reviews and risk assessments, especially when it comes to renal and endocrine degradation. Those in the affected family who have a history of consanguineous marriages should seek genetic counselling. Outside-the-family marriages should be encouraged in view of aetiology.

REFERENCES

1. Laurence JZ, Moon RC : Four cases of 'retinitis pigmentosa' occurring in the same family, and accompanied by general imperfections of development. *Obes Res* 1995; 3: 400403. FOUR CASES OF "RETINITIS PIGMEN-TOSA'" OCCURRING IN THE SAME FAMILY, AND ACCOMPANIED BY GENERAL IMPERFECTIONS OF DEVELOPMENT. - LAURENCE - 1995 - Obesity Research - Wiley Online Library
2. Khan BA, Shahid A, Bin Nazir M, Khan KS, Punshi A. Laurence-Moon-Bardet-Biedl Syndrome: A Case Report. Cureus. Sep 10;11(9),2019. Cureus | Laurence-Moon-Bardet-Biedl Syndrome: A Case Report
3. Kumar, Sumir & Mahajan, Bharat & Mittal, Jyotisterna. Bardet-Biedl syndrome: A rare case report from North India. Indian journal of dermatology, venereology and leprology. 78. 228,2012. (PDF) Bardet-Biedl syndrome: A rare case report from North India (researchgate.net)
4. Manara E, Paolacci S, D'Esposito F, Abeshi A, Ziccardi L, Falsini B, Colombo L, Iarossi G, Pilotta A, Boccone L, Guerri G, Monica M, Marta B, Maltese PE, Buzzonetti L, Rossetti L, Bertelli M. Mutation profile of BBS genes in patients with Bardet-Biedl syndrome: an Italian study. Ital J Pediatr. 2019 Jun 13;45(1):72. Mutation profile of BBS genes in patients with BardetBiedl syndrome: an Italian study (nih.gov)
5. Beales PL, Elcioglu N, Woolf AS, Parker D, Flinter FA. New criteria for improved diagnosis of BardetBiedl syndrome: results of a population survey. J Med Genet. 1999;36:437446. New criteria for improved diagnosis of Bardet-Biedl syndrome: results of a population survey (nih.gov)
6. Forsythe E, Sparks K, Hoskins BE, Bagkeris E, McGowan BM, Carroll PV, et al. Genetic predictors of cardiovascular morbidity in Bardet-Biedl syndrome. *Clin Genet* (2015) 87(4):3439. Managing BardetBiedl SyndromeNow and in the Future (nih.gov)
7. Hamlington B, Ivey LE, Brenna E, Biesecker LG, Biesecker BB, Sapp JC. Characterization of courtesy stigma perceived by parents of overweight children with Bardet-Biedl syndrome. PLoS One (2015) . Characterization of Courtesy Stigma Perceived by Parents of Overweight Children with Bardet-Biedl Syndrome. - Abstract - Europe PMC
8. Daskalakis M, Till H, Kiess W, Weiner RA. Roux-en-Y gastric bypass in an adolescent patient with Bardet-Biedl syndrome, a monogenic obesity disorder. Obes Surg. (2010) 20(1):1215. Roux-en-Y Gastric Bypass in an Adolescent Patient with BardetBiedl Syndrome, a Monogenic Obesity Disorder | SpringerLink
9. Mujahid S, Huda MS, Beales P, Carroll PV, McGowan BM. Adjustable gastric banding and sleeve gastrectomy in Bardet-Biedl syndrome. Obes Surg (2014) 24(10):17468. Adjustable gastric banding and sleeve gastrectomy in Bardet-Biedl syndrome - PubMed (nih.gov)

Cite this article : S.Manasa, M.Alekhya, G.Ramya Bala Prabha, T.Rama Rao
A rare case report on bardet-biedl syndrome
Asian J. Pharm. Hea. Sci.. 2021;11(2):2562-2564. DOI : 10.5530/ajphs.2021.11.25