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# A CASE REPORT: BECKWITH WEIDEMENN SYNDROME

**T.Anila Reddy[1],G.Vineeth Reddy[1], A. Kottai Muthu[2], B.S Sharvana Bhava[1*],**
[1] *Department of Clinical Pharmacy & Pharm.D., MGM Hospital, Vaagdevi College of Pharmacy, Hanamkonda, Warangal, Telangana, India.*
[2]*Associate Professor, Department of Pharmacy, FEAT, Annamalai University, Annamalai Nagar-608002, Chidambaram, Tamil Nadu, India.*

## ABSTRACT
Beckwith-Weidemenn-syndrome (BWS) is an overgrowth disorder usually present at birth, characterized by an increased risk of childhood cancer and certain congenital features. A minority (<15%) cases of BWS are familial, meaning that a close relative may also have BWS, and parents of an affected child may be at increased risk of having other children with BWS. While children with BWS are at increased risk of childhood cancer, most children with BWS do not develop cancer and the vast majority of children who do develop cancer can be treated successfully.

**Keywords:** Beckwith-Weidemenn-syndrome, Macroglossia

## INTRODUCTION
Patients were first noted to have abdominal wall defects, macrosomia, macroglossia, and enlarged adrenal glands. Since then, clinical presentation has expanded to recognize hemihypertrophy/lateralized overgrowth, hyperinsulinism, omphalocele, and organomegaly as classic features of BWS. Additionally, it is now recognized that there is a range of clinical features seen in patients with BWS. Presentation of BWS occurs on a spectrum ranging from isolated asymmetry to classic features of BWS.It is a pediatric cancer predisposition disorder caused by changes in the imprinted gene loci on chromosome 11p15 [1]. While most autosomal genes are expressed biallelically, imprinted genes are expressed either from the maternal or paternal allele. These genes are regulated by specific regions near the genes called imprinting control regions (ICRs), which contain epigenetic marks (methylation) that coordinate gene expression. BWS is caused by genetic or epigenetic changes that disrupt theparent-of-origin specific expression of these genes [2,3]. The imprinted gene regions involved in BWS are *H19/IGF2* and *CDKN1C/KCNQ1OT1*, all genes implicated in growth during early development. *H19* encodes a long noncoding RNA that is maternally expressed; it is believed to act as a tumor suppressor. *IGF2*, or insulin-like growth factor 2, is a paternally expressed protein-coding gene. IGF2 is highly active during fetal development and acts as a growth promoter. *CDKN1C*, or cyclin-dependent kinase inhibitor 1C, is a gene that encodes a protein implicated in cell cycle regulation. *KCNQ1OT1*, or potassium voltage-gated channel subfamily Q member 1 opposite transcript 1 is the antisense transcript of the protein-coding gene *KCNQ1*. *KCNQ1OT1* is implicated in regulating other growth genes[4].Incidence is estimated to occur in 1 in 10,500 live births in the general population[5]. BWS is a congenital disorder that is commonly diagnosed in early childhood. Patients with BWS have an increased risk of developing embryonaltumors in childhood. Particularly, patients with BWS have an increased risk of developing hepatoblastoma before 4 years of age and Wilmstumor before 7 years of age [6]. Clinical features of BWS typically decrease with age. Regardless of specific presentation, all diagnosed children should be screened for tumor growth. Current screening recommendations are as follows-Ultrasound Screening, Full abdominal ultrasound every three months until age 4 years, Renal ultrasound every three months from age 4-7 years[7].

Alpha-fetoprotein (AFP) screening-AFP measurements every three months until age 4 years. Patients with Beckwith-Wiedemann syndrome (BWS) may require escalated care to manage persistent hypoglycemia. This may include treatment with diazoxide, octreotide, continuous feeds or in some cases partial panpancreatectomy. [6] Consultation with experts in managing hyperinsulinism is recommended.

**Address for correspondence:**
*Anila Reddy*
*Department of Clinical Pharmacy& Pharm.D*
*Vaagdevi College of Pharmacy*
*Warangal, Telangana-506007*

## MATERIAL AND METHODS
The Patient visited MGM Hospital with fever, headache and other associated symptoms. Caretakers consent was seeked and explained about this case report publication. The Protocol and Written acceptance of them was submitted and got approved from Institutional Human Ethics Committee (IHEC).

## CASE REPORT

A male child of 11 years old was admitted in pediatric ward of MGM Hospital with fever-intermittent type associated with chills, vomitings, abdominal pain, low IQ and suffered from Dengue one month back. Family history was nil significant. Laboratory values were suggestive of leukopenia with lymphocytosis, RBS- 50mg/dl. He was tested positive for widal. From his childhood patient had suggestive features of BWS. Based on previous history and physical examination, patient was assessed with BWS. As there no specific treatment for this condition he was treated empirically for pyrexia with paracetamol, cefotaxime, ranitidine and multivitamin supplementation.

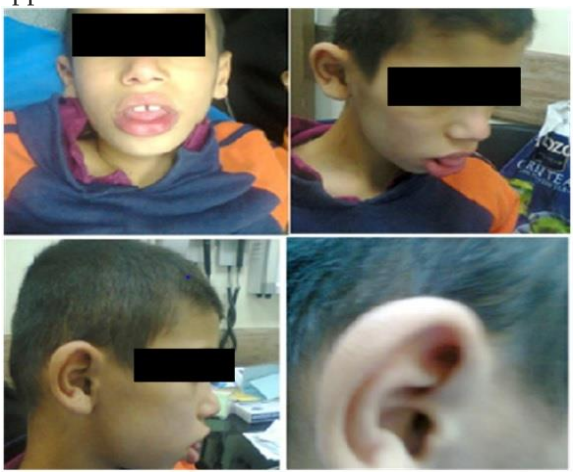

**Figure 1: Patient with BWS having macroglossia and earcreases.**

## DISCUSSION

Patients with Beckwith-Wiedemann syndrome often have some or many of the following characteristics. Based on the new BWS consensus scoring system, cardinal features are awarded 2 points each and suggestive features are awarded 1 point each. A total of 4 points is sufficient for a clinical diagnosis. Greater than 2 points suggests the need for genetic testing for BWS[1,8].Cardinal features of BWS include Macroglossia, Hyperinsulinism, Omphalocele, Lateralized overgrowth/hemihypertrophy – typically presented as asymmetric muscle bulk, rather than length, Multifocal Wilmstumor/nephroblastomatosis, Pathology findings including adrenal cortical cytomegaly, placental mesenchymal dysplasia, or pancreatic adenomatosis. Suggestive features of BWS include-Birth weight > 2 SDS above mean, Facial nevus simplex, Polyhydramnios and/or placentomegaly, Ear creases and /or pits, Transient hypoglycaemia, Embryonaltumors (hepatoblastoma, isolated Wilmstumor, neuroblastoma, pheochromocytoma, rhabdomyosarcoma, adrenocortical carcinoma), Nephromegaly and or hepatomegaly, Umbilical hernia/diastasis recti[9, 10, 11]. It is not curable and have no treatment options. Surgical procedures are available but not reliable.

## CONCLUSION

Beckwith-Weidemann syndrome (BWS) is a heterogeneous syndrome that could affect one or multiple systems. Classic features may or may not be obvious at birth. The etiology of BWS is complex. Most cases are sporadic molecular alterations of genes in the chromosome 11p15 region. The index of suspicion should be high when evaluating a case of BWS, with strong consideration of the use of genetic/molecular testing to confirm the diagnosis. Anticipatory guidance of the complications is fundamental in the care for these patients, with special consideration of a tumor protocol surveillance given the high risk of developing embryonaltumors during infancy and childhood. Early diagnosis and a holistic management approach with a multidisciplinary team are also indispensable to ensure a good prognosis for the patient.

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## COMPETING INTERESTS

The Authors declare that they have no competing interests.

## AUTHORS CONTRIBUTION

T.Anila Reddy worked in the Hospital in collection of data, Counseling the patient and their family, etc., G.Vineeth Reddy designed the documents required for the work. A Kottai Muthu, B.S.Sharavanabhava discussed and conceived the idea of doing this work and prepared the Protocol.

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