

Beckwith-Wiedemann Syndrome in a Premature Dizygotic Female Twin: A Case Report

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Summary

Beckwith-Wiedemann Syndrome is a congenital disease that is rare and has low prevalence worldwide. It presents classically with features of macroglossia, abdominal wall defects (omphalocele), and macrosomia at birth. Other typical manifestations include facial nevus simplex, ear lobe abnormalities (creases and/or pits), transient hypoglycemia, and renal abnormalities seen on ultrasound. We report a case of a female preterm infant of twin gestation presenting at our level 4 hospital's newborn unit with typical features of the syndrome. We aimed to create further awareness on the diagnosis in secondary health institutions and management of common features and complications of the syndrome. There is a paucity of pictorial evidence of

morphology and literature related to the syndrome in an African child and this case report aims to improve that. No case has been previously reported in the Kenyan setting.

Keywords: Beckwith-Wiedemann syndrome, Macroglossia, Omphalocele, Facial nevus simplex, Twins

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Introduction

Beckwith-Wiedemann syndrome (BWS) is a part of congenital overgrowth syndromes (1, 2). Epidemiology shows a low worldwide prevalence, with Spain reporting 0.13 for every 10,000 live births (2) and Italy reporting 1 in 10,340 (3). The exact incidence is unknown in our setting (Kenya). The syndrome was described by two doctors, Beckwith in 1963 (4) and Wiedemann (5) in 1964. BWS presents with macroglossia (97–100%), abdominal wall defects (77–80%), hypoglycemia (63%), and macrosomy (68%) (1, 2, 6). Other features of BWS may include minor features such as cleft palate, visceromegaly, renal alteration, ear creases/pits hyperinsulinemia, and microcephaly (2, 6). DeBaun et al., in an attempt to systemize the diagnostic criteria of BWS, suggested two out of any of the following five features: neonatal hypoglycemia, omphalocele, ear lobe

abnormalities, macroglossia, and macrosomia (7). A diagnostic criteria of three major features (macrosomia, macroglossia, and abdominal wall defects) or two major features and three minor features (facial nevus simplex, hemi hyperplasia, ear lobe creases and pits, nephromegaly, and neonatal hypoglycemia) was suggested by Elliott et al. (8). BWS results from the genetic alteration in imprinting and methylation of the chromosomal band 11p15. The imprinted genes affected are two clusters of the insulin growth factor 2 (*IGF2/H19*) and *CDKN1C/KCNQ1OT1*. Monozygotic twins, mostly females, have been reported to be discordant for BWS due to skewed imprinting in *KCNQ1OT1* (6, 7, 9).

Case presentation

A middle-aged Kenyan woman, para 2+0, with twin gestation delivered at 33 weeks via cesarean section secondary to twin gestation. The mother reported no known illnesses. No history of major events was reported in the antenatal period. Ultrasound performed during the antenatal period was normal. No history of exposure to known teratogens in utero was reported. The first twin (discussed hereby) was female, with birth weight of 1900 g and Apgar score of 9/10 at 1 minute, 10/10 at 5 minutes, and 10/10 at 10 minutes. The patient cried immediately at birth and was admitted to the newborn unit at our facility on the first day of life due to low birth weight, prematurity, and anterior abdominal wall defect. She was noted to have an anterior abdominal wall defect approximately 5×4 cm, with loops of bowel inside it (omphalocele), a large protruding tongue (macroglossia), a discoloration on the left side of the face (facial nevus simplex), and ear lobe creases and pits (Figure 1). A diagnosis of BWS was therefore considered. No other abnormality was detected, and the baby remained in fair and stable general condition. Prophylactic intravenous crystallized penicillin and gentamycin was prescribed. Breastfeeding was initiated immediately, and random blood sugar measurements taken serially for 3 days showed normal sugar levels. Complete blood count, liver function tests, thyroid function test, and urea, creatinine, electrolyte tests were done, and all came back with normal values. An abdominal ultrasound was also requested, which showed normal abdominal organs and viscera. A surgical consult was done due to the anterior abdominal wall defect, where a decision on conservative management was made. However, on the second day of life, the omphalocele sac ruptured, exposing the bowels, and this was repaired primarily in theater under general anesthesia without any complications (Figure 2). Low birth weight was managed as per protocol, and the patient discharged after 10 days. The second twin was a male baby, with birth weight of 1800 g and Apgar score of 8/1 at 1 minute, 10/5 at 5 minutes, and 10/10 at 10 minutes, with no abnormalities. The low birth weight was managed as per protocol, and the patient discharged on day 8 of life. Our patient is currently on follow-up at

our surgical outpatient clinic and pediatric outpatient clinic.



Figure 1. (a) Omphalocele and macroglossia.



Figure 1. (b) Facial nevus simplex and macroglossia.



Figure 1. (c) Right ear pits and creases.



Figure 1. (d) Left ear pits and creases.



Figure 2. Post-omphalocele repair.

the macrocranium with a head circumference of 58.5 cm but had no sunset eyes. (Normal head circumference at birth is 35cm and 40-45 cm at 18 months of age) (5). Gaze was appropriate without nystagmus or any cranial

Discussion

A diagnosis of BWS was made clinically in our case according to a scoring system developed in an international consensus statement on clinical and molecular diagnosis screening and management of BWS (6). A score >4 according to the consensus statement warrants a clinical diagnosis of BWS. Cardinal features that have a score of 2 points per feature include macroglossia, omphalocele, and suggestive features,

with a score of 1 point per feature, including facial nevus simplex, ear creases, and/or pits were present in our patient, giving a total score of 6. DeBaun et al. also defined a patient to have BWS if he/she had at least two of the five common features associated with BWS (macroglossia, macrosomia, midline abdominal wall defects, ear creases, and neonatal hypoglycemia). Abdominal wall defects (omphalocele) can be repaired surgically or can be managed conservatively. Conservative management includes application of topical agents such as povidone iodine and silver sulfadiazine around the wound edges to encourage epithelialization of the sac. A rare complication of conservative management is rupture of the sac (as in our case), which requires surgical management. Surgical management involves a single closure for small- and medium-sized defects. Large defects may require a staged procedure because respiratory insufficiency might occur due to the reduction of large contents of the sac into a relatively smaller abdominal cavity. Macroglossia is the most common feature of BWS and is present in 90% of the patients. In many cases, it resolves on its own and become less noticeable as the child grows. However, when it causes speaking, feeding, and breathing difficulties or even psychosocial issues related with the aforementioned, surgery is recommended, which, in this case, is glossectomy (10). It involves removing a small part of the tongue so that it fits within the mouth to allow for proper jaw and tooth development. Glossectomy aims to ensure efficient form and improving the function of the tongue. Nevus simplex is mainly distributed in the glabella, upper eyelids, nose, forehead, and lips (as in our case) and nape is usually benign, and does not require any treatment. BWS predisposes the patients to cancer such as Wilms’ tumor, hepatoblastoma, and neuroblastoma; therefore, screening is an important feature in their subsequent follow-up. Wilms’ tumor is screened via ultrasound imaging at an interval of every 3 to 4 months. Hepatoblastoma is screened using abdominal ultrasound imaging in isolation or together with alpha-fetoprotein levels. Neuroblastoma can be screened using tumor markers in the urine, including vanillylmandelic acid and homovanillic acid. The catecholamine-to-creatinine

ratio is also an important marker. Ultrasound imaging modality is also important in the screening of neuroblastoma, and this can be undertaken quarterly until the third year of life (6).

Conclusion

BWS, although rare, occurs in our setting. A high index of suspicion is needed especially in children presenting with abdominal wall defects and macroglossia in order to rule out BWS. Macroglossia and omphalocele provide a challenge in management and therefore immediate handling of complications that come with these, including difficulty feeding or breathing or even rupture of the omphalocele sac, is advised. If managed well, patients with BWS have a good prognosis and live normal lives.

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