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Beckwith-Wiedemann Syndrome in a patient with full-term pregnancy, case report.

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ABSTRACT

Beckwith-Wiedemann Syndrome (BWS) is a rare congenital disorder caused by alterations to the IGF2 gene. Its incidence has increased with the use of assisted reproduction techniques. We present a case of a patient with BWS who experienced anaphylactic shock during delivery, likely related to oxytocin use. Multidisciplinary management is necessary in cases of prenatal diagnosis, with a focus on early correction of hypoglycemia and structural defects. BWS is associated with an increased risk of childhood cancer, and the use of assisted reproduction techniques may further increase this risk. Clinicians should be aware of the potential complications associated with BWS in pregnant patients and their newborns.

KEYWORDS: Beckwith-Wiedemann-Syndrome, pregnancy, anaphylaxis.

MANUSCRIPT

Introduction

Beckwith-Wiedemann Syndrome (BWS) is a multisystem congenital disorder characterized by excessive growth, hypoglycemia, and macroglossia. Its incidence is estimated at around 1 in every 10,000-13,700 cases births[1], with autosomal dominant inheritance, reduced penetrance, and variable expressivity. The syndrome is caused by various alterations to the IGF2 gene in the 11p15.5 region[2], which leads to heterogeneity in clinical presentation, mainly associated with growth disorders and alterations in insulin type 2 due to gene coding sharing.

Given the wide range of implications of these genes, various criteria have been cited to guide clinical

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diagnosis, including: Major Criteria: abdominal wall defect, macroglossia, macrostomia, embryonal tumors, malformations in the auricular pavilion, visceromegaly, hemi-hyperplasia, renal and ureteral anomalies, cleft palate; Minor Criteria: prematurity, neonatal hypoglycemia, flammeus nevus on the glabella, typical facies, placentomegaly, polyhydramnios, cardiomegaly, rectus diastasis, hemi-hyperplasia[1,3]. Diagnosis can also be made during the prenatal stage by performing amniocentesis, associated with cytogenetic, molecular, and biochemical studies, as well as obstetric ultrasound.

The association of BWS with childhood cancer is estimated to be between 4% and 21%, mainly embryonic tumors such as Wilms tumor (52%), hepatoblastoma (14%), neuroblastoma (10%), adrenocortical carcinoma, pheochromocytomas, and rhabdomyosarcomas[2,3]. However, the heterogeneity in its presentation has been understood based on the alterations that generally occur, with four main expression mechanisms being hypermethylation in IC1 (H19/IGF1:IG-DMR), hypomethylation in IC2 (KCNQ10T1:TSS-DMR), paternal uniparental disomy, and alterations in CDKN1C[4,5,6]. The presence of these mechanisms is related to a higher morbidity and mortality rate in infants due to differences in medical interventions for their proper management.

During recent years, with the growth of assisted reproduction techniques, an increase in cases of BWS has been observed, leading to the study of the association of these techniques. For instance, Vermeiden and Bernardus conducted a review to study the association between BWS and assisted reproduction techniques in eight epidemiological studies, finding a higher risk of developing BWS than in the general population, with a relative risk of 5.2 (95% confidence interval 1.6-7.4)[5]. Similarly, Mussa and Molinatto correlated the prevalence of BWS between the general population and the assisted reproduction registry in Piemonte, Italy, finding a higher incidence of BWS associated with assisted reproduction techniques, with a relative risk of 10.7 (95% confidence interval 4.7-24.2)[6].

In cases of prenatal diagnosis of BWS, a multidisciplinary management of the newborn should be carried out, focusing on properly guiding parents about possible risks and complications, performing complementary serological, molecular, and imaging studies, mainly focused on the early correction of hypoglycemia that immediately endangers the newborn's life, as well as managing structural defects related to the individual presentation of the disease[7].

Case presentation

A clinical case is presented of a patient diagnosed with BWS and a full-term pregnancy who experienced anaphylactic shock probably secondary to the use of oxytocin.

A 20-year-old primigravida presented with spontaneous membrane rupture three hours prior to admission and irregular uterine activity.

Past medical history: diagnosed with SBW at birth, with multiple corrective interventions associated with pathologies, such as correction of omphalocele (at birth), right mastectomy (at 10 years), right femoral reduction (at 12 years), and placement of a right breast expander (at 18 years). No allergies were reported.

Gynecological history: menarche at 9 years, menstrual cycle of 28x5, first sexual intercourse at 19 years, Papanicolaou smear 1, last menstrual period on January 10, 2021, prenatal care: 7 visits to the health center, no significant past medical history or infections during pregnancy.

The pregnancy was interrupted via abdominal delivery due to cephalopelvic disproportion attributable to the maternal pelvis, with a Kerr-type cesarean section using the Misgav Ladash technique, resulting in a female newborn, weighing 3,015 grams, measuring 48 cm in length, Capurro gestational age of 40 weeks, Apgar score of 8-9, and 300 ml blood loss. During the surgical procedure, the patient presented with hypotension, tachycardia, and a skin rash, and an echocardiogram and pulmonary ultrasound were performed during the surgery, which did not show any pathological findings. The anaphylactic reaction was managed with fluid therapy, norepinephrine, and hydrocortisone, which resulted in improvement, and was presumed to be related to the use of prophylactic intravenous oxytocin at a dose of 10 IU.

Discussion

SBW is characterized by multiple congenital defects related to morphological and structural alterations in the patient. While it does not directly affect fertility, it is directly associated with mortality in patients who present the syndrome and is also related to multiple endocrinological and oncological alterations. In addition, it can present with abdominal wall defects that can complicate term pregnancies.

CONCLUSION

SBW can occur in newborns through autosomal dominant inheritance in 15% of cases, with 85% being idiopathic. Monitoring of children of affected mothers should begin with detailed prenatal ultrasound to detect structural abnormalities. In adult patients, the endocrine system is affected due to a deficiency of

hypothalamic hormones, as well as an increase in prolactin levels with a deficient response of luteinizing hormone, affecting fertility. Therefore, pregnancy is infrequent in these patients. It is essential to monitor hearing loss every 2-3 years, the renal system with a renal ultrasound and urinary calcium every 3-5 years, and the cardiovascular system with echocardiography every 3-5 years[5].

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CONFLICT OF INTEREST

The authors declare they have no conflict of interest.

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