Maternal and Fetal Tuberous Sclerosis: Do We Know Enough as an Obstetrician?

Nalini Sharma 1*, Shriram Sharma 2, Jion Lalnun nem Thiek 1, Santa Singh Ahanthem 1, Arnab Kalita 3, Donboklang Lynser 3

1- Department of Obstetrics and Gynecology, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences Shillong, Meghalaya, India
2- Department of Neurology, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences Shillong, Meghalaya, India
3. Department of Radiology, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences Shillong, Meghalaya, India

Abstract

Background: Tuberous sclerosis, also known as tuberous sclerosis complex (TSC), is a rare genetic condition that mainly causes hamartomas to develop in different parts of the body. TSC, an autosomal dominant trait with variable penetrance, can adversely affect maternal and fetal outcome.

Case Presentation: In this paper, a case of maternal and fetal tuberous sclerosis having fetal cardiac rhabdomyoma detected in utero at 26 weeks was reported who subsequently had fetal demise at 31 weeks.

Conclusion: Tuberous sclerosis is a rare genetic condition that mainly causes development of hamartomas. In tuberous sclerosis, a cardiac rhabdomyoma is the only sign that can be detected prenatally. In maternal tuberous sclerosis, fetal ECHO is advisable after 24 weeks. A pregnancy complicated by maternal or fetal tuberous sclerosis deserves careful observation and the fetus should undergo prenatal fetal Doppler echocardiography and if possible magnetic resonance imaging for evaluation of other fetal structures including brain and renal parenchyma, so that parents can be counseled regarding its future prognostic implications. Tuberous sclerosis can lead to poor fetal outcome including intrauterine fetal death; hence regular antenatal follow up is required. Genetic counseling is recommended for couples who have a family history of tuberous sclerosis and who want to have children. Prenatal diagnosis is available for families with a known gene mutation or history of this condition.

Keywords: Pregnancy, Tuberous sclerosis complex, Tuberous sclerosis.

Introduction

Tuberous sclerosis, also known as tuberous sclerosis complex (TSC), is a rare genetic condition that causes mainly development of hamartomas in different parts of the body. TSC, an autosomal dominant trait with variable penetrance, can adversely affect maternal and fetal outcome.

This case is presented because of its rarity (tuberous sclerosis with pregnancy) and it can adversely affect maternal and fetal outcome. The obstetrician should know about this entity.

Case Presentation

A 23 year old primigravida was referred to the antenatal outpatient department (OPD) for the first time at 10 weeks of gestation (May, 2016). She was a known case of tuberous sclerosis complex. She was on antiepileptic medication. The last episode of seizure was 5 years ago. There was no family history of tuberous sclerosis. On examination, adenoma sebaceum (Figure 1) was present. General physical examination and systemic examination findings were normal except for the presence of systolic murmur on auscultation. The
computed tomography scan (CT scan) of brain performed before pregnancy showed multiple parenchymal/perinuclear subependymal calcification, focolencephalomalacia. Echocardiography (ECHO) revealed a small patent ductus arteriosus (PDA) of 2 mm with left to right shunt. Fundoscopic examination revealed no abnormality. All the other routine antenatal investigations were normal. She was on regular follow up with regular consultation with neurologist. The anomaly scans which were performed at 13 and 20 weeks of gestation revealed no gross congenital anomaly. At 27 weeks of gestation while performing ultrasound for assessment of fetal growth, fetal cardiac rhabdomyoma (4×3.5 cm) (Figure 2) with other features of fetal hydrops (ascites, pericardial effusion, scalp edema, abdominal wall edema) was detected. Fetal cardiac rhabdomyoma was confirmed by fetal ECHO and MRI. Detailed antenatal anatomic survey using ultrasound ruled out angiolipoma of kidney and cerebral hamartoma. Cardiologist and cardiothoracic surgeon opinion was taken. Genetic counseling was done and patient was informed that the fetus was probably affected with tuberous sclerosis. The patient was recognized with intrauterine fetal demise by the antenatal OPD at 31 weeks of gestation (Figure 3). Induction of labour was done and the patient delivered a male, macerated baby weighing 1.2 kg. Intrapartum and peri-partum period was uneventful. She was discharged after 48 hr of delivery with the advice to refer to postnatal clinic, and neurology OPD later.

Discussion

Tuberous sclerosis, also known as tuberous sclerosis complex (TSC), is a rare genetic condition that mainly causes development of benign tumors in different parts of the body. The tumors most often affect the brain, skin, kidneys, heart, eyes and lungs. In the past, it was believed that the typical presentation included seizure, mental retardation, and facial angiofibroma (adenoma sebaceum) (Vogt’s Triad). This disorder has now wide variability of expression. Patients with TSC may be asymptomatic and of normal intelligence. TSC
Tuberous sclerosis is a rare genetic condition that mainly causes development of hamartomas. It can adversely affect maternal and fetal outcome. In tuberous sclerosis, a cardiac rhabdomyoma is the only sign that can be detected prenatally by ultrasound. In maternal tuberous sclerosis, fetal ECHO can be advisable after 22 weeks. A pregnancy complicated by maternal or fetal tuberous sclerosis deserves careful observation and the fetus should undergo prenatal fetal Doppler echocardiography and if possible an MRI for evaluation of other fetal structures including brain and renal parenchyma, so that parents can be counseled regarding its future prognostic implications (6).

Fetal cardiac rhabdomyomas are often benign and have a tendency to regress. It can occasionally induce poor outcome and the need for surgery depends on the patient's clinical presentation (7). Diagnosis is usually made on an obstetric ultrasound between 21 to 30 weeks. In our case, it was diagnosed at 26 weeks by obstetric ultrasound and fetal ECHO. Tuberous sclerosis can lead to poor fetal outcome including intrauterine fetal death; hence regular antenatal follow up is required. Genetic counseling is recommended for couples who have a family history of tuberous sclerosis and who want to have children. Prenatal diagnosis is available for families with a known gene mutation or history of this condition. However, tuberous sclerosis often appears as a new DNA mutation. These cases are not preventable.

**Conclusion**

Tuberous sclerosis is a rare genetic condition that mainly causes development of hamartomas. It can adversely affect maternal and fetal outcome. In tuberous sclerosis, a cardiac rhabdomyoma is the only sign that can be detected prenatally. In maternal tuberous sclerosis, fetal ECHO is advisable after 22 weeks.

A pregnancy complicated by maternal or fetal tuberous sclerosis deserves careful observation and the fetus should undergo prenatal fetal Doppler echocardiography and if possible an MRI for evaluation of other fetal structures including brain and renal parenchyma, so that parents can be counseled regarding its future prognostic implications. Tuberous sclerosis can lead to poor fetal outcome including intrauterine fetal death; hence regular antenatal follow up is required. Genetic counseling is recommended for couples who have a family history of tuberous sclerosis and who want to have children. Prenatal diagnosis is available for families with a known gene mutation or history of this condition.
Conflict of Interest

Authors declare no conflict of interest.

References

1. Daroff RB, Fenichel GM, Jankovic J, Mazziotta JC. Bradley’s Neurology in clinical practice. 6th ed. Philadelphia: Elsevier; 2012. p. 1508-14.

2. Agrawal SN, Kulkarni YA, Deshmukh YR, Jane SD. Tuberous Sclerosis in Pregnancy. Our Dermatol Online. 2014;5(2):160-2.

3. Gupta N, Singh N, Sarangi S, Dalmia S, Mittal S. Fetal cardiac rhabdomyoma with maternal tuberous sclerosis complicating pregnancy. Arch Gynecol Obstet. 2008;278(2):169-70.

4. King JA, Stamilio DM. Maternal and fetal tuberous sclerosis complicating pregnancy: a case report and overview of the literature. Am J Perinatol. 2005;22(2):103-8.

5. Bonebrake L, Rai K, Yankowitz J. Outcomes of pregnancies complicated by maternal tuberous sclerosis. Proc Obstet Gynecol. 2012;2(3):1-2.

6. Khanna PC, Godinho S, Pungavkar SA, Patkar DP. Ultrafast MRI in the prenatal diagnosis of Bourneville's tuberous sclerosis. Neurol India. 2005;53(3):349-50.

7. Pipitone S, Mongiovi M, Grillo R, Gagliano S, Serradello V. Cardiac rhabdomyoma in intrauterine life: clinical features and natural history. A case series and review of published reports. Ital Heart J. 2002;3(1):48-52.