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CASE REPORT

Severe Pulmonary Stenosis in a Newborn with Antenatal Exposure to Selective Serotonin Reuptake Inhibitor Drug: A Case Report

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Abstract

Depression in pregnancy is being recognized as a major contributor to adverse maternal and fetal outcomes. Recent years have seen significant research focused on the development of safe pharmacological methods to treat depression in pregnancy, resulting in the common use of selective serotonin reuptake inhibitors (SSRIs) as a first line of treatment. There have been a few reports of congenital birth defects associated with the consumption of SSRIs during pregnancy, particularly congenital heart defects. Several studies have attempted to evaluate the relationship between SSRI use and congenital heart defects in neonates, but they were inconclusive. In this report, a case where maternal SSRI intake during two consecutive pregnancies was associated with neonatal pulmonary valve stenosis, raising the possibility of a correlation between the usage of a certain SSRI, and a particular congenital heart defect has been described.

Keywords: Congenital heart defects, Depression, Pregnancy, Pulmonary valve stenosis, Serotonin uptake inhibitors

Introduction

Pregnancy is a dynamic process that brings with it, a variety of biological and psychological changes. The emotional challenges faced by mothers can manifest as depression, or pregnancy-specific anxiety. In some cases, pre-existing anxiety and/or depression, can be exacerbated by the stressors of pregnancy, often requiring intervention with psychotropic drugs, particularly when non-pharmacological modalities are ineffective. In the absence of treatment, these conditions can affect fetal outcomes, leading to prematurity and low birth weight while potentially persisting and being detrimental to maternal well-being during the postpartum period. [1]

In recent years, it has become common practice to prescribe Selective Serotonin Reuptake Inhibitors (SSRIs) to treat depression or anxiety during

pregnancy. According to a warning by the US Food and Drug Administration agency (FDA) in 2005, Paroxetine (an SSRI), carries a risk of cardiac malformations when used during pregnancy. Several studies have been conducted since then to determine whether SSRI use during pregnancy increases the risk of congenital cardiac defects, which have been inconclusive.

In this paper, a case where pulmonary valve stenosis was reported in two consecutive pregnancies, with associated maternal Escitalopram use during both pregnancies has been discussed.

Case presentation

A full-term baby girl was delivered via spontaneous vaginal birth at 39-weeks' gestation to a 41-year-old, gravida 4, para 4 mother with normal birth weight. The baby cried immediately at birth and did not require any resuscitative measures.

During the antenatal period, the mother had gestational diabetes which was managed with dietary control. Prior to conception, Escitalopram was taken regularly for her anxiety disorder. However, this medication was discontinued by the patient upon confirmation of the pregnancy at 6 weeks of gestation.

Due to resurfacing anxiety symptoms, she was prescribed another SSRI, Sertraline, at 16 weeks of gestation. After two weeks, her symptoms subsided and she stopped taking the medication. However, Sertraline had to be restarted at 29 weeks of gestation due to the recurrence of her anxiety, and this treatment was continued until the end of the pregnancy.

Of relevance, her previous child, born 9 years' prior, was diagnosed with severe pulmonary valve stenosis in the neonatal period and underwent balloon dilatation and valvuloplasty. All antenatal and anomaly scans performed during her last pregnancy were normal. She was non-diabetic and did not suffer from any other known medical conditions, however, she had been exhibiting symptoms of anxiety. The mother reported that she was taking the same medication, Escitalopram, for her anxiety disorder. Similar to the current pregnancy, she had discontinued the medication at 6 weeks of gestation. The couplehad a non-consanguineous marriage.

The second baby was clinically and hemodynamically stable, with no dysmorphic features. On the first day of life, a grade 3/6 harsh ejection systolic murmur was detected, best heard at the left sternal border. Both pre- and post-ductal oxygen saturations (SpO2) remained above 95% in room air. The baby did not have any dysmorphic features and karyotyping revealed no abnormalities.

The baby's cardiorespiratory condition was stable, and the chest x-ray was normal. On electrocardiogram (ECG), there was right-axis deviation, normal PR interval, normal QRS duration, and QTc 387 msec, with no ST or T-wave abnormalities.

Echocardiography revealed significant pulmonary valve stenosis with thickened and doming valves with valve attachments to the sino-tubular ridge (Fig 1). A pulmonary gradient of 60 mmHg, mean pressure of 44 mm Hg, annulus of 5.5 mm, and mild pulmonary regurgitation was observed with post-stenotic dilatation. There was a small persistent foramen ovale (PFO) with aneurysmal flap formation bulging and right-to-left shunting. A patent ductus arteriosus (PDA) of 2.5 mm with left-to-right shunting was also present. Biventricular function and aortic arch were normal.

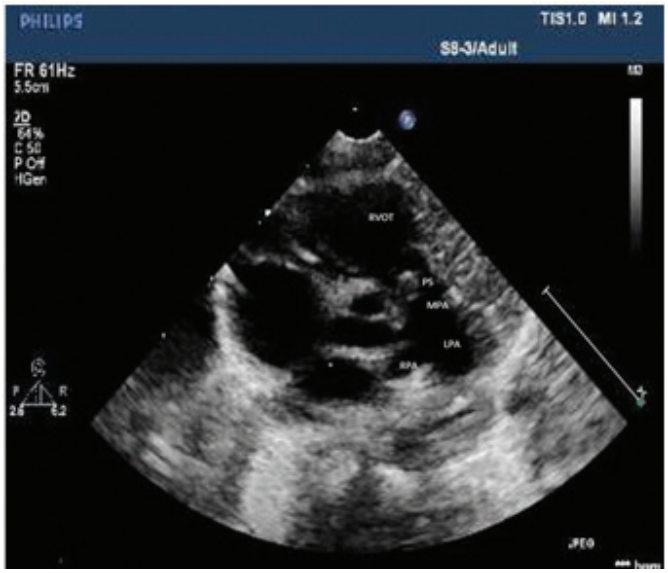

Fig.1 Echocardiographic image of pulmonary stenosis. RVOT: Right ventricular outflow tract. PS: Pulmonary stenosis. MPA: Main pulmonary artery. LPA: Left pulmonary artery. RPA: Right pulmonary artery

Around 18 hours of life, the baby's saturation fell to 85% in room air requiring administration of nasal oxygen and infusion of Prostaglandin. Medical intervention led to a rise in saturation of more than 95%. Oxygen support was then gradually discontinued, and by the 5th day of life, the prostaglandin infusion was tapered off. Since then, the baby remained clinically stable. A second echocardiography on the 7th day of life revealed similar results to that of the previous one, demonstrating severe pulmonary valve stenosis. Owing to these findings, the baby was transferred to a tertiary cardiac facility on the 10th day of life, where trans-catheter balloon dilatation of the pulmonary valve was performed. The post-operative course was uneventful, and the baby remained well on subsequent follow-up visits.

Patient consent was obtained for publication.

Discussion

An infant with severe pulmonary valve stenosis was presented in this case, with a background history of SSRI use by the mother, i.e., Escitalopram during the early first trimester and Sertraline during the second and third trimesters.

The presence of the same congenital heart disease; Right Ventricular Outflow Tract Obstruction (RVOTO) in both children, accompanied by a history of SSRI usage by the mother during the first trimester of pregnancy on both occasions, provides the basis for a possible correlation between SSRI use and heart defects.

The precise mechanism by which SSRIs cause heart defects remains uncertain. Signaling molecules such as serotonin are essential for progenitor cells to establish laterality, outflow tract development, differentiation of myocardial cells, and septation of heart chambers. Abnormal serotonin levels induced by SSRIs during this crucial period of early pregnancy may result in faulty morphogenesis. [2]

Based on a meta-analysis in 2015, no link was found between prenatal use of SSRIs and cardiac malformations. [3] However, a recent review and meta-analysis discovered that the use of SSRIs increased the risk of cardiac defects. [4] Similarly, a study carried out assessing antidepressant use and the risk of congenital malformations also found a substantial increase in the risk of cardiovascular malformations following maternal Paroxetine use. [5]

An analysis carried out by the National Birth Defects Prevention Study (NBDPS) found that Paroxetine and Fluoxetine use during pregnancy wass associated with an increased risk of several subtypes of congenital heart disease, particularly atrial septal defects (ADSs), ventricular septal defects (VSDs), and right ventricular outflow tract obstruction (RVOTO).[6]

Sertraline use during the first trimester of pregnancy was found to have an association with the development of cardiovascular malformations. [7] Similarly, there was an interesting parallel identified between maternal Citalopram exposure and congenital heart defects. However, there were no reports specifically correlating to pulmonary valve stenosis.[8]

In summary, depression and anxiety are common presentations during pregnancy that necessitate early detection and intervention to prevent adverse fetal and maternal outcomes. A woman's safety is paramount when starting psychotropic medication during pregnancy, and deciding which medication to prescribe remains a significant challenge for many physicians.

The current case was identified owing to the presence of a related cardiac malformation in two

consecutive pregnancies, with accompanying maternal usage of Escitalopram. However, similar findings have not been noted in other publications.

Further research to establish a possible relationship between SSRI usage during pregnancy and congenital cardiac malformations is required.

Conflicts of interest

None

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