



Analysis of Heart Diseases in Pregnancy

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Cardiac diseases complicate 1% of all pregnancies. It is one of the 3 major indirect causes of maternal mortality in India.

Methodology: This qualitative study was conducted at Saveetha medical college and hospital. Out of 1320 women who delivered between June 2020 to June 2021, 15 women had heart disease and they were included in the study. All the 15 women were asymptomatic.

Results: A total of 15 pregnant women were included in the study. There were no twin pregnancies. In total, 2 women presented with congenital heart disease and 13 women with acquired heart disease. Out of the 15 women, 4 delivered vaginally and the remaining 11 had undergone LSCS.

Discussion: During pregnancy, major changes occur in the cardiovascular system to meet the increasing metabolic needs of the mother and fetus. If these changes are not met with, it can lead to maternal and fetal morbidity. Failure to make normal adjustments can worsen an existing heart condition or early manifestations of a previously unknown condition, and therefore pregnancy is a natural stress test. The changes that occur during pregnancy and the physiology of pregnancy itself will enhance some pathological processes of the heart. Understanding these changes is important, and adjustments may vary from person to person.

Conclusion: A developing cardiovascular disorder should be detected as early as possible and also it should be a priority in pregnancy monitoring, and if a disorder is identified, the cardiologist team should be involved immediately. Many groups dedicated to managing heart problems during pregnancy, is recommended as it leads to better clinical outcomes.

Keywords: Heart diseases; pregnancy; cardiovascular disorder.

1. INTRODUCTION

The association between heart disease and pregnancy is increasingly prevalent. Many diseases occur for the first time during pregnancy [1]. But certain diseases are worsened during pregnancy. Cardiac diseases complicate 1% of all pregnancies. It is one of the major indirect causes of maternal mortality in India [2]. Hypertensive disorders, valvular diseases, cardiomyopathies, aortic diseases etc. are the common cardiac conditions. Early and specialized multidisciplinary care in the antepartum, intra-partum and postpartum time frames is essential to improve the outcome of the diseases [3]. But after 2010, the rate of maternal mortality began to decline, despite increase in the number of high risk patients. This decline is attributed to improvement in medical service [4]. This means that with proper preventive measures, these diseases can be detected early and the progress of the disease can be altered.

2. METHODOLOGY

This qualitative study was conducted at Saveetha medical college and hospital. Out of 1320 women who delivered between June 2020 to June 2021, 15 women had heart disease and they were included in the study. All the 15 women asymptomatic. Patients were evaluated for developmental of any cardiac complication, obstetric complication and perinatal outcomes.

3. RESULTS

In this study, 1.13% of the pregnancies were complicated by heart diseases. A total of 15 pregnant women were included in the study. There were no twin pregnancies. In total, 2 women presented with congenital heart disease and 13 women with acquired heart disease. One had patent foramen ovale and the other one had ventricular septal defect. Women with congenital heart disease had undergone surgery early in life. Out of the 13 women with acquired heart disease, 5 women had history of rheumatic fever in the past.

Table 1. Heart disease

Type of heart disease	Number
1. CONGENITAL	2
2. ACQUIRED	13

The common valvular diseases were mitral stenosis with mitral regurgitation, mitral valve

prolapse and tricuspid regurgitation. They were diagnosed only when they were asked to take ECHO as a part of their routine antenatal checkup during their second trimester. Since all the patients were asymptomatic, they were not started on any medication but were closely monitored and followed up.

Table 2. Common valvular diseases

Congenital heart diseases	Number
1. Patent Foramen Ovale	1
2. Ventricular Septal Defect	1
Acquired heart diseases	
1. Mitral valve prolapse only	4
2. Mitral valve prolapse with mitral regurgitation	1
3. Mitral valve prolapse with MR and TR	1
4. Infective Endocarditis	1
5. Mitral stenosis with mr and ar	2
6. Pulmonary artery hypertension	2
7. Mitral and tricuspid regurgitation	2

Out of the 13 women with acquired heart diseases, 4 had only mitral valve prolapse. One woman had mitral valve prolapse with mitral regurgitation and has had 3 spontaneous abortions previously. Another one had mitral valve prolapse with both tricuspid and mitral regurgitation since conception. One woman was diagnosed with infective endocarditis while she was in labor and had history of rheumatic fever with mitral regurgitation and past history of pulmonary TB. Two women had mitral stenosis and both mitral and aortic regurgitation. Two women had mitral regurgitation and tricuspid regurgitation with pulmonary artery hypertension. Two women had both mitral and tricuspid regurgitation. No coronary artery diseases were reported.

Table 3. Delivery mode

Mode of delivery	Number
1. VAGINAL	4
2. LSCS	11

Out of the 15 women, 4 delivered vaginally and the remaining 11 had undergone LSCS. Only one neonatal complication was reported where the child had pulmonary atresia, ventricular septal defect and overriding of the aorta. All the pregnancies were uneventful. 8 women were primipara and 7 women were multipara indicating that primipara women are at an increased risk of developing heart diseases. In this study, age was

not identified as a risk factor for the development of the diseases.

4. DISCUSSION

During pregnancy, major changes occur in the cardiovascular system to meet the increasing metabolic needs of the mother and fetus. If these changes are not met with, it can lead to maternal and fetal morbidity. Failure to make normal adjustments can worsen an existing heart condition or early manifestations of a previously unknown condition, and therefore pregnancy is a natural stress test. The changes that occur during pregnancy and the physiology of pregnancy itself will enhance some pathological processes of the heart. It is important to understand these changes and the adjustments may vary from person to person.

Women can experience these physiological changes as early as 5 weeks after their pregnancy. Many of these changes are believed to be the result of the placenta sticking to the walls of the uterus, inducing the release of hormones and subsequent changes in maternal physiology. These changes are usually hemodynamic and counter-regulatory, but retain the basic vascular principles of maintaining the new mean arterial pressure of pregnancy.

4.1 Cardiac Output

Cardiac output increases from 20-50%. Within first five weeks of gestation, these changes can be seen and continue to increase till the due gestational age. Due to this increase, women with heart diseases experience a drastic effect during pregnancy. Also it can lead to complications like pulmonary edema or fluid overload states.

4.2 Heart Rate

As the stroke volume increases, the heart rate also increases by 15-30% which also leads to an increased output state.

4.2.1 Systemic vascular resistance

There is a decrease in the systemic vascular resistance during pregnancy by about 30%. And also vasodilators like prostaglandins and nitric oxide are also released at an elevated rate.

4.3 Blood Pressure

The blood pressure drops during the first trimester of pregnancy but eventually rises during

the third trimester [5]. The diastolic fall is more than the systolic fall.

Congenital valvular heart diseases are more common in women of childbearing age, but it can also be caused by rheumatic, acquired, or degenerative causes. Many women have a history of valvular repair. A cardio-obstetric team should evaluate all women with a previous history of cardiac disease prior to conception irrespective of its outcome. Women with regurgitant, stenotic or ventricular dysfunction should be explained the risks and the outcomes beforehand.

The frequency of monitoring, the makeup of the care team, delivery preparation, and pregnancy management are all based on the patient's risk. The ACOG guidelines, which were just released, propose using the updated WHO categorization to estimate risk and then manage it. Severe valvular heart disease should ideally be treated prior to pregnancy. In each case, clinical judgement should be used; valve replacement should be considered before opting for anticoagulant regimens during pregnancy. In most cases, valvular regurgitant lesions are well tolerated during pregnancy. Because of the reduced afterload caused by low-resistance placental circulation and a projected decrease in systemic vascular resistance, these lesions are less likely to produce problems. However, if problems persist despite adequate medical treatment prior to conception, valve repair or replacement should be considered. When systemic vascular resistance quickly increases due to a large total body volume, women with valvular regurgitant lesions may be at risk for developing pulmonary edema postpartum [6]. A study conducted in west Kenya showed that rheumatic heart disease was the most common cardiac disease in pregnancy and was complicated by mitral stenosis and pulmonary hypertension. Another study conducted at Uttar Pradesh revealed that the incidence of cardiac disease in pregnancy was 0.8% and majority of the women were primi-gravida. Thus, timely diagnosis and proper management of the patients with heart diseases can help in reducing the mortality and morbidity associated with it.

5. CONCLUSION

Valvular heart disease was shown to be the most common kind of heart disease, with rheumatic fever being the most common aetiology, followed

by congenital heart illnesses. The link between heart problems and pregnancy is becoming more common. Pregnancy necessitates a number of changes that individuals with heart disease may not be able to accept. Women with known or suspected heart disease who intend to become pregnant should be assessed and monitored prior to conception so that the individual's risk can be stratified and the necessary steps may be planned ahead of time.

A developing cardiovascular disorder should be detected as early as possible and also it should be a priority in pregnancy monitoring, and if a disorder is identified, the cardiologist team should be involved immediately. Many groups dedicated to managing heart problems during pregnancy, is recommended as it leads to better clinical outcomes.

CONSENT AND ETHICAL APPROVAL

As per international standard or university standard guideline Patient's consent and ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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