

UNVEILING THE MYSTERIES: INVESTIGATING FETOMATERNAL OUTCOMES IN PREGNANT WOMEN WITH CONGENITAL HEART DISEASE

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Abstract

Background: Pregnancy complicated by heart disease is a significant contributing factor to maternal mortality and morbidity. Maternal heart disease accounts for approximately 0.2% to 2% of pregnancies and is responsible for 10% to 20% of maternal deaths. The purpose of our study was to assess the outcomes for both the mother and foetus in pregnancies complicated by heart disease including congenital heart disease. **Materials and Methods:** This was an observational prospective study conducted at Government Medical College Bettiah Bihar. The study included 31 pregnant women with either known or newly diagnosed heart disease. Baseline data was collected, including demographic characteristics, NYHA functional class, maternal complications, mode of delivery, and neonatal outcomes. **Result:** Among the 31 patients with cardiac disease, 19 were primigravida. The majority, 90.6% , were classified as NYHA Class I or II. Rheumatic heart disease was observed in 27 patients, while congenital heart disease was present in 4 subjects. The most common type of heart disease was mitral stenosis. Vaginal delivery was performed in majority of patients, while 41% underwent caesarean section. The foetal outcomes were predominantly live births with 27.4% of babies requiring admission to the neonatal intensive care unit. **Conclusion:** The use of modern monitoring techniques, a better understanding of the pathophysiology of cardiac disease, and a multidisciplinary approach to care can significantly improve the outcomes for both the mother and foetus in pregnancies complicated by heart disease.

INTRODUCTION

Pregnancy places a significant burden on the cardiovascular system, posing challenges for obstetricians, cardiologists, and neonatologists.^[1] The prevalence and types of cardiovascular diseases vary across different countries.^[2] Currently, approximately 0.2 - 2% of pregnancies are complicated by cardiovascular disease.^[3] These cardiac disorders contribute to about 20.5% of maternal deaths.^[4] The ratio of rheumatic heart disease (RHD) and congenital heart disease (CHD) is decreasing due to advancements in pediatric care and early surgical interventions. The number of women with cardiac disease reaching reproductive age has increased due to modern therapeutic options, leading to multiple attempts at pregnancy.^[5] The functional status of the mother, often measured by the NYHA functional class, is a crucial predictor of outcomes.^[6] Poor functional status and cyanosis are associated with adverse outcomes for both the mother and the baby.^[7] In developing countries, anaemia is a

significant factor that can worsen heart failure. Pregnant women with cardiac disease can be categorized into two groups: those with diagnosed heart disease receiving treatment before pregnancy and those with previously undiagnosed heart disease. Both cardiac lesions and pregnancy can have adverse effects on each other. It is crucial to thoroughly evaluate these patients for underlying cardiovascular disease to ensure optimal care during pregnancy.^[8] Collaborative efforts from an obstetrician, cardiologist, anaesthetist, and neonatologist are crucial for the optimal care of both the mother and foetus. By working together, they can prevent complications that may strain the heart and ensure a safe outcome. Additionally, the patient and her family's commitment to regular follow-up appointments is essential for a successful and healthy pregnancy.

MATERIALS AND METHODS

This observational study was conducted at department of obstetrics and gynaecology, Government Medical College Bettiah Bihar over a period of one year from November 2022 to October 2023. The study was approved by institutional ethical and research committee. All study participants were informed about the study and an written and informed consent was taken from all the participants before the conduction of study.

The study sample involved 31 pregnant women who had either known or newly diagnosed heart disease. The diagnosis of heart disease was confirmed through ECG and echocardiography. If a chest X-ray was required, an abdominal shield was used to protect the fetus. The study included both booked antenatal cases and unbooked emergency cases. The patients received regular care at the antenatal clinic and were also regularly seen by a cardiologist. The data for the study were obtained through a review of medical records. Baseline data, including age, parity, gestational age, type of lesion, duration of disease, time of diagnosis, treatment history, New York Heart Association (NYHA) functional class, maternal complications, mode of delivery, indication for caesarean section, neonatal outcomes (such as APGAR score at 1 and 5 minutes, birth weight, maturity (>37 weeks), and admission to NICU), were recorded. In cases of maternal mortality, the cause of death was also noted. The patients were assessed for the mode of delivery, and those without any contraindications were allowed to have a spontaneous vaginal delivery. The patients were advised on the importance of getting adequate rest. They were provided with iron and folate supplements and discharged after 10 days with appropriate postnatal advice.

RESULTS

Out of the 31 cardiac patients, 74.19 % were between the ages of 20-30, and 61.29 % were primigravida. The majority of patients (48.39 %) received irregular antenatal care, with 61.29 % being diagnosed as cardiac patients before pregnancy and 38.71 % being diagnosed after pregnancy. In terms of residence, 61.29 % of patients were from rural areas and 38.71 % were from urban areas. Among the patients, 90.32% were housewares and 9.68 % were working. In terms of education, 56 .02 % completed primary education, while 23 .39 % passed secondary education or higher.

Among the cardiac patients, 87.1 % had rheumatic heart disease, 12.9 % had congenital heart disease, and 3.23 % suffered from peripartum cardiomyopathy. The most common type of rheumatic heart disease was mitral stenosis, seen in 35.48 % of cases. Other cardiac complications included mitral regurgitation, aortic regurgitation, and ASD in congenital heart disease. The common symptoms reported by patients were breathlessness, palpitation, cough, generalized weakness, and leg oedema.

The majority of patients (88.2%) belonged to New York Heart Association (NYHA) Class I and II, with 9.8% in Class III and 2% in Class IV. Maternal obstetrical complications included anemia, preeclampsia, hypothyroidism, placenta previa, breech, twin pregnancy, APH, and PPH. Cardiac complications included congestive cardiac failure, atrial fibrillation, pulmonary edema, and pulmonary atrial hypertension. The majority of patients (86.3%) were more than 37 weeks gestational age at the time of delivery. Vaginal delivery was performed in 47.1% of patients, while 41.2% underwent LSCS. Other delivery methods included forceps, ventouse, and assisted breech. The overall maternal outcome showed that 76.5% of patients were discharged with advice, 9.8% required CCU, 5.9% were referred to ICU, and there were 2 cases of maternal mortality.

Table 1: Demographic characteristics of the study subjects.

Parameter	Number	Percentage
Age		
<20	5	16.13
20-30	23	74.19
>30	3	9.68
Gravida		
Primi	19	61.29
Gravida 2	8	25.81
Gravida 3 or more	4	12.90
ANC		
Regular	10	32.26
Irregular	15	48.39
No	6	19.35
Time of Diagnosis		
Before Pregnancy	19	61.29
After Pregnancy	12	38.71
Gestational age at Delivery		
Term	26	83.87
Preterm	5	16.13
Occupation		
House maker	28	90.32

Working	3	9.68
Residence		
Urban	12	38.71
Rural	19	61.29

Table 2: Types of heart disease among study population.

Parameter	Number	Percentage
Rheumatic Heart Disease	27	87.10
Mitral stenosis	11	35.48
Mitral Regurgitation	4	12.90
Mitral Stenosis +Mitral Regurgitation	6	19.35
Aortic Stenosis +Aortic Regurgitation	1	3.23
Mitral Regurgitation+Aortic Regurgitation	4	12.90
Mitral stenosis+Tricuspid regurgitation+ Pulmonary Regurgitation	2	6.45
Mitral stenosis+Pulmonary Hypertension	1	3.23
Congenital	4	12.90
ASD	2	6.45
VSD	1	3.23
MVP	1	3.23
Peripartum cardiomyopathy	1	3.23

DISCUSSION

In the current investigation, we identified the specific type of heart condition in pregnant women and evaluated the outcomes for both the mother and foetus. It is important to note that cardiac disease remains a significant risk factor for maternal and neonatal mortality and morbidity. The majority of the women included in the study were experiencing their first pregnancy and had sought prenatal care. These findings align with a study conducted by Sheela et al, which yielded similar results. The majority of patients (88.2%) were classified as NYHA class I and II, which is consistent with the findings of other studies.^[11,12] Hsieh et al reported in their study that 75% of foeto maternal deaths occurred in patients classified as NYHA class III and IV.^[13] In our study, the most prevalent cardiac lesion was rheumatic heart disease (86.3%), with mitral stenosis being the most common manifestation. These results are in line with the studies conducted by Mahesh et al and Nilajkumar et al.^[14,15] Congenital heart disease accounted for 12.9 % of cases, with atrial septal defect (ASD) being the most frequently observed anomaly. Similar findings were reported in studies conducted by Sheela et al and Nilajkumar et al.^[15] Regarding delivery in 26 women had a spontaneous vaginal delivery, while almost half underwent a Caesarean section primarily due to obstetrical indications. Instrumentation was used to expedite the second stage of labor in 9.8% of patients. The majority of cases were associated with anemia (47.1%) and preeclampsia (21.6%), both of which exacerbated the underlying cardiac condition during pregnancy. Therefore, early detection and management of complications such as anemia and preeclampsia can significantly improve outcomes. Similar results have been reported in studies conducted by various authors.^[16,17]

Fifteen patients (29.4%) experienced cardiac complications, with nine (17.6%) developing congestive cardiac failure, two experiencing atrial fibrillation, and three having pulmonary edema. The

overall maternal outcome showed that 76.5% of patients were discharged with advice, 9.8% required CCU, 5.9% were referred to ICU, and there were two cases of maternal mortality. Similar findings were observed in studies conducted by Mahesh et al.^[18,19] Seven 13.7 % babies were classified as small for gestational age, and a total of 25.5 % babies (were admitted to the NICU. The perinatal mortality rate in our study was 2%. These results were consistent with the studies conducted by Mahesh et al, Hanania et al, and Suri et al,^[20,21] Despite the potential for significant maternal morbidity in patients with cardiac disease, favorable outcomes can be achieved through careful antenatal, intrapartum, and postpartum management.

CONCLUSION

In summary, pregnancy complications related to heart disease, particularly rheumatic heart disease, significantly affect the outcome of pregnancy. By utilizing advanced monitoring techniques, enhancing our knowledge of the underlying mechanisms of cardiac disease, and implementing a multidisciplinary approach to care, we can greatly enhance the well-being of both the mother and the foetus, ultimately reducing the risks of maternal and foetal mortality and morbidity.

REFERENCES

1. Burlingame J, Horiuchi B. The contribution of heart disease to pregnancy-related mortality according to the pregnancy mortality surveillance system. *J Perinatal.* 2012; 32: 163-9.
2. Surge D, Blake S. Pregnancy complicated by maternal heart disease at the National maternity Hospital, Dublin 1969-1978. *Am J Obst Gyne.* 1981; 139(1): 1-6.
3. Barbosa PJ, Lopes AA. Prognostic factors of rheumatic mitral stenosis during pregnancy and puerperium. *Arq Bras Cardiol.* 2000; 75: 215-24.
4. Sawhney H, Aggarwal N, Grover A. Maternal and perinatal outcome in rheumatic heart disease. *Int J Gynaecology Obstet.* 2003; 80: 9-14.
5. Cunningham FG, Leveno KJ. *Cardiovascular Disease In Williams Obstetrics.* 24th edition. McGraw Hill Education; New York; 2010.

6. James, Steer, High risk pregnancy management option. In Cardiac disease in pregnancy. 4th edition: 2012; 627-656.
7. Bhatla, Yadav, Mishra. The cardiac case. In Ian Donald's practical obstetrics problems. 6th edition. BI Publications Pvt Ltd. India. 2010; 103-126.
8. Davies GA, Herbert WN. Assessment and management of cardiac disease in pregnancy. *J Obstet Gynaecol.* 2007; 29(4): 331-6.
9. Ohana P, Onaka A, Sauvage LM. The contribution of heart disease to pregnancy-related mortality according to the pregnancy mortality surveillance system. *J Perinatal.* 2012; 32: 163-9.
10. Sheela CN, Karanth S, Patil CB. Maternal cardiac complications in women with cardiac disease in pregnancy. *Int. J Pharma Biomed Res.* 2011; 2(4), 261-5
11. Koregeol M, Nina, Nayak R, Amritha. Maternal and perinatal outcomes of pregnancies complicated by cardiac disease. *J Turkish German Gynaecol Assoc.* 2009; 10: 30-4.
12. Vasu S, Stergiopoulos K. Valvular heart disease in pregnancy. *Hellenic J Cardiol.* 2009; 50: 498-510.
13. Hsieh TT, Chen KC, Soong JH. Outcome of pregnancy in patients with organic heart disease in Taiwan. *Asia Oceania J Obstet Gynaecol* 2007; 19: 21-7
14. Bhatla N, Lal S, Behra G, Kriplani A, et al. Cardiac Disease in pregnancy. *Int J Gynaecol Obstet.* 2003; 82: 153-9.
15. Kovavisarach E, Nuaplot P. Outcome of pregnancy among parturients complicated with heart disease in Rajavithi hospital. *J Med Assoc Thai.* 2007; 90: 2253
16. Surge D, Blake S, Donald D. Pregnancy complicated by maternal heart disease at the National maternity Hospital, Dublin 1969- 1978. *Am J Obst Gyne.* 1981; 139(1): 1-6.
17. Barbosa PJ, Lopes AA, Feitosa GS. Prognostic factors of rheumatic mitral stenosis during pregnancy and puerperium. *Arq Bras Cardiol.* 2000; 75: 215-24.
18. Sawhney H, Aggarwal N, Suri V. Maternal and perinatal outcome in rheumatic heart disease. *Int J Gynaecology Obstet.* 2003; 80: 9-14.
19. Sheela CN, Karanth S, Patil CB. Maternal cardiac complications in women with cardiac disease in pregnancy. *Int. J Pharma Biomed Res.* 2011; 2(4), 261-5.
20. Koregeol M, Nina, Nayak R, Amritha. Maternal and perinatal outcomes of pregnancies complicated by cardiac disease. *J Turkish German Gynaecol Assoc.* 2009; 10: 30-4.
21. Vasu S, Stergiopoulos K. Valvular heart disease in pregnancy. *Hellenic J Cardiol.* 2009; 50: 498-510.