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Original Research Article

Maternal and perinatal outcome in cardiac disease complicating pregnancy

Krupa R. Mange, Vidyadhar B. Bangal*

Department of Obstetrics and Gynecology, Rural Medical College, Pravara Institute of Medical Sciences, Loni, Ahmednagar, Maharashtra, India

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***Correspondence:**

Dr. Vidyadhar B. Bangal,

E-mail: vbb217@rediffmail.com

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ABSTRACT

Background: Maternal cardiac disease associated with pregnancy is considered as a high-risk pregnancy. Various physiological and hemodynamic alterations during the course of pregnancy make these women prone for various complications and related morbidity and mortality.

Methods: A prospective cross-sectional study of 105 cases of pregnancy complicated by cardiac disease, reporting to tertiary care hospital for delivery, was carried out to find out the maternal and perinatal outcome.

Results: The incidence of cardiac disease in pregnancy in the present study was 0.54%. Most of the women (91%) belonged to low socioeconomic class. Rheumatic heart lesions constituted 87% of the cases. Mitral stenosis alone or in combination, was the commonest (57%) valvular lesion. Incidence of spontaneous vaginal delivery was 53 percent and for ventouse or outlet forceps was 12 percent. Incidence of caesarean section was 35%. There were 2 maternal deaths, one each due to complication like pulmonary oedema and atrial fibrillation. The perinatal mortality was 36 per 1000 live births, mainly due to combination of factors like prematurity, low birth weight, neonatal sepsis and birth asphyxia.

Conclusions: Early diagnosis of heart disease, regular antenatal checkup, institutional delivery, limiting family size can reduce the maternal and perinatal mortality and morbidity associated with heart disease.

Keywords: Cardiac disease in pregnancy, Rheumatic heart disease, Maternal mortality

INTRODUCTION

Maternal cardiac disease associated with pregnancy is considered as a high-risk pregnancy. Various physiological and hemodynamic alterations during the course of pregnancy make these women prone for various complications and related morbidity and mortality. As such, hemodynamic changes during normal pregnancy are well tolerated by women with normal cardiac reserve. Diseased heart shows signs of de compensation with resultant increase in morbidity and mortality. Fetal health depends upon an adequate and continuous supply of well-oxygenated maternal blood. In uncompensated heart disease, the oxygen supply becomes limited and that

result in compromised fetal growth. There can be growth restriction, premature birth or may even fetal death.

Cardiac lesions are usually secondary to streptococcal rheumatic infection during childhood. It still remains as the commonest etiological factor for heart disease complicating pregnancy. It is because of frequent and repeated streptococcal infections in areas with poor sanitary conditions. In many pregnant women, heart disease still remains undiagnosed until complications develop. Even after the diagnosis, many women do not comply with the instructions given by obstetrician for various reasons. Women having additional obstetrical complications further worsen the prognosis. In western countries, maternal heart disease complicates 1-3% of

pregnancies and is the third common cause of maternal death during pregnancy.¹⁻³

Heart disease is one of the 3 major indirect causes of maternal mortality in India. Most data concerning pregnancy course in heart disease patients are anecdotal reports or are in small series; only a few comprehensive studies are available.⁴⁻⁹ The primary objective of the present study was to study the incidence of the different cardiac lesions during pregnancy and to assess the effect of heart disease on maternal and fetal health.

METHODS

This prospective cross-sectional study was conducted for 2 years period from January 2018 to December 2019 at Pravara rural hospital, which is a tertiary care center in Ahmednagar district. All pregnant women with diagnosed cardiac disease, who were admitted either in antenatal ward, intensive care unit or in labour room were enrolled in the study. Cardiologist's opinion was taken regarding cardiac status and safety of women during pregnancy and delivery or caesarean section. Joint management by physician and obstetrician was undertaken, whenever required. Detailed medical and obstetric history, keeping in mind the cardiac lesion was gathered through interview during first visit to hospital or labour room. Thorough clinical examination was performed to find out the type of cardiac lesion, any signs of failure, fetal wellbeing, duration of pregnancy. The case was then investigated with specific investigations to confirm the cardiac lesion and the cardiac functional status. Cases were graded as per NYHA classification. They were explained about the importance of rest, medication and regular antenatal visits. In every visit, physician was consulted for their opinion regarding cardiac status. Patients were told to have compulsory institutional delivery. Unregistered cases who reported to labour room were managed as per the cardiac status. Patients were kept for 8-10 days after delivery and were discharged with advice about contraception, breast feeding and antibiotic prophylaxis and cardiac surgery, if needed.

RESULTS

The total no of patients admitted for delivery during the study period were 19,408. This included 105 cases of cardiac disease with different types of lesions. Thus, the incidence of cardiac disease in pregnancy was 0.54%.

It was observed that, out of 105 cases studied, 73% were booked. The maximum patients were in the age group of 21 to 30 years (88%) and few were in the age group of 15 to 20 years (8.5%). The youngest patient was 18 years old and the oldest patient was of 37 years. Most of the women (91%) belonged to lower socioeconomic class. Distribution of cases as per timing of registration revealed that 73% women were registered during pregnancy.

In the present study, Rheumatic cardiac lesions constituted 87% of the cases, 47% women had isolated mitral stenosis, 17% percent women had mitral stenosis and pulmonary hypertension, and 8.5% each had either mitral regurgitation or combine mitral regurgitation and mitral stenosis. It was observed that 43, 32, 14 and 11% cases presented with NYHA grade 1 to 4 respectively. Mitral stenosis was the commonest heart lesion in 47% of the lesion.

Incidence of spontaneous vaginal delivery was 53% and ventouse or outlet forceps were carried out in 12 percent cases. The average duration of labor was 5 hours in multigravida and 6-8 hours in primigravidae. One patient had atonic post-partum haemorrhage, which was managed with medical methods. Incidence of caesarean section was 35%. Common indications of caesarean section were NYHA grade 3 and 4 lesions, associated abnormal presentations, multi-fetal pregnancy, previous two caesarean sections, fetal distress, postdated pregnancy and caesarean on demand.

There were 2 maternal deaths, one each due to complications like pulmonary oedema and atrial fibrillation. It was observed that the incidence of Low-birth-weight babies was 61% among the women who had cardiac lesion. The perinatal mortality was 36 per 1000 live births, mainly due to combination of factors like prematurity, low birth weight, neonatal sepsis and birth asphyxia.

DISCUSSION

Over last few decades, the percentage of women with cardiac disease, who reach childbearing age, has increased due to the improved diagnostic and treatment facilities. As a result, these women get an opportunity to have their reproductive career. The majority of the patients (67%) were either primigravidae or primipara. In the present study, 73% cases were registered during antenatal period. This shows good awareness among the community and better referral services from government and private practitioners to tertiary care hospital. Rheumatic heart lesions constituted 87% of the cases.

The incidence of RHD is higher, as most of the patients belonged to low socioeconomic class where poverty, poor nutrition, low level of sanitation and hygiene and inaccessibility to health services was common. Isolated mitral stenosis were the commonest heart lesion in 47% of the lesion. Most patients (42.8%) belonged to grade I functional heart disease and 31.4% of the cases belong to grade II heart disease. There were 10 cases with a history of mitral valvotomy done within 2 years before conception. They stood the pregnancy very well and delivered spontaneously at term without any complications. The puerperium was also uneventful.

There were 6 cases of cardiac failure. Cardiac failure occurred most commonly between 28 to 36 weeks of

gestation. Only one patient developed failure during puerperium. There were two maternal deaths. Both these women were unregistered multi-gravida with multiple valve involvement. They reported in labour with cardiac failure and arrhythmia. The perinatal mortality was 36 per 1000 live births.

Accurate assessment of the individual maternal and fetal risk during pregnancy is of fundamental importance for optimal patient outcome. Despite the diversity and broad morphological and functional variability of heart diseases, few predictors for complications during pregnancy have been recently described. In a prospective multicenter study enrolling 562 women with heart disease monitored in 13 Canadian hospitals, Siu et al identified poor functional NYHA class or cyanosis, left ventricular systolic dysfunction, and left heart obstruction as major determinants for maternal cardiac complications.⁶ In the clinical setting, this classification proved to be basically useful and enabled reliable assessment not only of maternal but also of fetal/neonatal risk. Review of the literature indicates that mortality among minimally symptomatic pregnant women with cardiac disease is about 1%: i.e., within the range of the incidence among the healthy general population.^{10,11} In contrast, pregnant women with severe symptoms have been reported to experience a mortality risk up to 5-15%.¹²

CONCLUSION

Cardiac disease complicating pregnancy is a high-risk situation and demands special attention throughout pregnancy. An expert supervision and management by the obstetrician, cardiologist or physician and the fullest co-operation by the patient throughout antenatal, intranatal and post-natal period, results in achieving the optimum maternal and perinatal outcome. It is essential to educate the rural population about the importance of regular antenatal visits and institutional delivery. Establishing the facility for cardiac surgery at affordable cost in rural area will certainly go a long way in decreasing the mortality, morbidity related to cardiac disease complicating pregnancy.

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