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A study on maternal and fetal outcome among pregnant women with cardiac diseases in a tertiary care centre

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Abstract
Background: Cardiac disease is an important cause of maternal mortality and morbidity both in antepartum and postpartum period. The overall incidence of heart disease in pregnancy is <1%.
Aims and Objectives: To determine the maternal and fetal outcome among pregnant women with cardiac diseases in a tertiary care centre.
Methods: This study was conducted in the Department of Obstetrics and Gynaecology at sree mookambika institute of medical sciences kulasekharam. 100 women with heart disease which were previously established or diagnosed during pregnancy were enrolled in the study.
Results: The prevalence of heart disease amongst all pregnancies found in hospital was 6.3%. The principal cause of cardiac lesion was Rheumatic heart disease (RHD) (66%) while congenital heart disease was seen in 17%.
Conclusion: Counselling, appropriate referral and antenatal supervision improve the pregnancy with heart disease outcome.

Keywords: Mitral valve stenosis, pregnancy, rheumatic heart disease

Introduction

Cardiac disease is one of the important cause of maternal mortality and morbidity both in antepartum and postpartum period. Cardiac disease in pregnancy is broadly divided into congenital and acquired. The acquired group includes RHD, cardiomyopathies and ischemic heart disease. Of these, in developing countries rheumatic heart disease is the commonest type, whereas cardiomyopathies and congenital heart disease one more common in developed countries. Among all presentations of Rheumatic heart disease, mitral stenosis is the predominant lesion and accounts for nearly three quarters of all cases. The overall incidence of heart disease in pregnancy is <1% [1]. The presence of maternal heart disease effects on the fetus in a number of ways. The risk of spontaneous miscarriage and therapeutic abortion increases in women with heart disease [2]. The children borne from the mother with congenital heart disease are at increased risk of congenital heart disease. The overall risk of inheriting polygenic cardiac disease is 3-5%, as compared to 1% risk in the general population [3]. This risk is dependent on the condition of affected parent and there is an increased risk if a previous siblings are affected. [4] Some cardiac medications can have adverse effects on the fetus such as ACE inhibitors, warfarin and statins. ACE inhibitors are teratogenic especially during first trimester and should therefore be avoided during this period [5]. The use of Statins during pregnancy is controversial However, epidemiological data suggests that statins are not major teratogens. So, it is still advisable to avoid statins during the first trimester [6]. Cardiovascular abnormalities are considered most important non-obstetric cause of morbidity and mortality during pregnancy. In women of childbearing age, Rheumatic and Congenital heart diseases are currently the most frequently found cardiovascular diseases. In developed countries, the prevalence of pregnancy complicated by rheumatic heart disease (RHD) has decreased. Previous ratio of 3:1 for RHD to congenital heart disease complicating pregnancy is now essentially reversed but in developing countries rheumatic heart diseases are still predominant and continues to be a major cause of maternal morbidity and mortality. In western countries, maternal heart diseases are the third most common cause of maternal death and complicates 1-3% of pregnancies [7, 8]. Cardiac diseases can complicate 1-4% of pregnancies in women without pre-existing cardiac abnormalities.
Cardiac disease is one of the three major indirect causes of maternal mortality in India. Pregnancy can cause certain therapeutic problems, which may threaten maternal and fetal well-being and survival [9].

The circulatory changes of pregnancy in the presence of maternal heart disease may result in adverse consequences even death of the mother or fetus [10]. Pregnancy is a challenge to women with heart disease because of the 50% increase in plasma volume and six-fold increase in the risk of thrombosis. [11] In developing countries, a large number of women become pregnant prior of seeking therapeutic intervention for cardiac lesions and many of them are only diagnosed with heart disease during pregnancy. [12] Detailed assessment of patient throughout pregnancy may lead to initial discovery of heart disease. If diagnosed early, and managed properly with multidisciplinary approach, collaboration of a team of trained obstetricians, cardiologist, anaesthetist, pediatrician and nurse, it results in successful outcome for mother and child in majority of cases [13]. In women with normal reserve, Hemodynamic changes of normal pregnancy are well tolerated. However, decompensation occurs in diseased heart, with resultant increase in maternal morbidity and mortality. In western countries, maternal cardiac disease complicates 1-3% of pregnancies and is the third common cause of maternal death during pregnancy [7, 8]. Cardiac diseases complicate 1-4% of pregnancies in women without pre-existing cardiac abnormalities. Heart disease is one of the 3 major indirect causes of maternal mortality in India.

Aims and Objectives

To find out the maternal and fetal outcome among pregnant women with cardiac diseases in a tertiary care center.

Materials & Methods

This study was conducted in the Department of Obstetrics and Gynecology of sree mokambika institute of medical science 100 women with heart disease which were previously established or diagnosed during pregnancy were enrolled in the study. All pregnant women with congenital or acquired cardiac lesions or delivered patients with heart disease who were referred to our hospital were included and those with associated medical disorders like Diabetes mellitus, pulmonary disease, renal disease or any other endocrinological disease were excluded from this study. Data recorded included were age, parity, gestational age, cardiac lesions, use of cardiac medications, thorough clinical examination including chest and cardiovascular auscultation, ECG and echocardiographic assessment of left and right ventricular systolic function. The mode of delivery whether vaginal, use of instruments and the need for LSCS and neonatal details were duly recorded.

Results

A total of 100 women where pregnancy was complicated by heart disease were included in the study.

In Table 1:Among the women who had Rheumatic heart disease, Mitral Valve stenosis being the most common lesion and was seen in 66(66%). amongst all pregnancies found in the hospital was 6.3%. Congenital heart disease was present in 17% patients, 8% with previous cardiac diseases. Cardiomyopathy was the most common cardiac disease in the miscellaneous group, constituting 9 (9%).

Table 1: Distribution of cardiac lesion in pregnant women

Lesion	Number of patients	Percentage
RHD	66	66%
Congenital	17	17%
Previous Cardiac Surgery	8	8%
Miscellaneous	9	9%
Total	100	100

In table 2: Majority of women delivered by cesarean section 48(48%). 25 (25%) subjects had a normal vaginal delivery with spontaneous onset of labour and induced. 20 (20%) had assisted instrumental vaginal delivery, MTP accounts for 7 %. Nil maternal death.

Table 2: Maternal outcome of pregnancy in term of mode of delivery

Mode	Number	Percentage
LSCS	48	48%
Vaginal Delivery Sponatneous	21	21%
Vaginal Delivery Induced	4	4%
Instrument Delivery	20	20%
Maternal Deaths	0	0
MTP	7	7%

Table 3: Out of 100 patients, there were nil maternal death. seven (7%) women had first trimester abortions. There were about 100(100%) live births observed in these women. Among Apgar > 9 is 82% and <9 is12%, 45% NICU admission. No neonatal death.

Table 3: Perinatal outcome in maternal heart disease pregnancy

Perinatal Outcome		Number	%
Birth	Live	100	100
	Still Birth	0	0
Apgar Score	>9	82	82
	<9	12	12
NICU Admission	Yes	45	45
	No	48	48
Neonatal Death		No	No

Discussion

This study aimed at assessment of maternal and neonatal complications associated with cardiac disease in pregnancy. various studies estimated that 0.3% to 3.5% of all pregnancies are complicated by heart disease. In the present study, the prevalence of 6.3% was found which was same as that of the study conducted by puri s *et al* [19]. In the current study Rhd (66%) was the principal cardiac lesion and mitral stenosis was the most common cardiac lesion (45%). these results were in consensus with vidyadhar *et al* [14], mazhar sb *et al* [20], devabhaktuni *et al* [15], and n bhatla *et al* [1]. however incidence of rhd has been greatly reduced in developed countries by widespread use of antibiotics effective against the streptococcal infections. Thus current study indirectly indicates inadequate treatment of streptococcal infections in childhood and adolescence. Echocardiography was done routinely in our patients.

In this study, 21% women had spontaneous vaginal delivery as compared to 41% (Nilajkumar *et al* [16]); 24% (Alireza *et al* [21]); 76.2% (Mazhar *et al* [20]); 73.5% (Hameed *et al* [17]); 62.8% (Vidyadhar *et al* [14]) in other studies. cesarean section (48%) was done only for obstetrical indications. nilajkumar *et al* [16] reported caesarean in 20.6%; 9.5% by mazhar *et al* [20]; alireza *et al* [21] (76%). In the present study,4 of women underwent labour induction as compared to 15% in study conducted by hameed *et al* [17] and pratibha d *et al* [15]. in the evaluation of pregnancy with cardiac disease 7% had to undergone MTP which was comparable to suman *et al* [19] and mazhar *et al* [20] studies. Mortality in pregnant females with cardiac disease is mainly due to cardiac failure and pulmonary oedema and there was no death in our study which was comparable to hameed *et al* [17], mazhar *et al* [20], alireza *et al* [21], verena *et al* [18] and akhtar *et al* [17] studies. All pregnancy were ended in live birth, were observed

in these women and no still births which was comparable to mazhar *et al* [20] study.

Conclusion

Present data supports the fact that the prognosis of pregnant women with heart disease has improved, leading frequently to successful outcome. Proper evaluation of maternal prognosis prior to conception and adequate clinical follow up during pregnancy are both fundamental measures for obtaining a satisfactory outcome in these patients.

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