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Research Article

A study to assess cardiac diseases in pregnancy and pregnancy outcome

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ABSTRACT

Background: Heart disease has a significant impact on fetal and maternal health during pregnancy, labor and delivery. In India and other developing countries, rheumatic heart disease is most common. Cardiac disorders are observed in approximately 1% of pregnancies; they account for morbidity and mortality rates. The objective of the study was to analyze the effect of cardiac diseases on maternal and fetal outcome.
Methods: Hospital based cohort study was done for a period of 5 years. All pregnant women with cardiac disease were the study participants. Total numbers of women with cardiac disease were 390.
Results: It was observed that majority of the study participants were suffering with mitral stenois (30%), followed by mitral regurgitation (25%) and mitral strenosis and regurgitation (12%). Very few women died because of certain complications, atrial fibrillation (1%), congestive cardiac failure (1%) and pulmonary embolism (1%). The overall perinatal mortality was found to be 4% in the present study.
Conclusions: Proper screening of the pregnant women to rule out any cardiac disease is required. If timely intervention are taken to treat the pregnant women with cardiac disease the morbidity and mortality in mother and foetus can be prevented to a great extent.

Keywords: Pregnancy, Heart disease, Mitral stenosis

INTRODUCTION

Cardiac disorders are observed in approximately 1% of pregnancies; they account for morbidity and mortality rates and pose challenges in management.[1-4] Diseases of the heart are broadly divided into congenital and acquired. Common congenital heart diseases include atrial septal defect and ventricular septal defect. The acquired group comprises rheumatic heart disease, cardiomyopathies and ischaemic heart disease.[5,6]

Heart disease has a significant impact on fetal and maternal health during pregnancy, labor and delivery.[7] The majority of women with cardiac disease can tolerate pregnancy successfully without major complications.[8-11] However, in some of the patients, pregnancy can cause certain therapeutic problems, which may threaten maternal and fetal well being and survival. In the presence of maternal heart disease, the circulatory changes of pregnancy may result in adverse consequences, including death of the mother or fetus.[12]

In India and other developing countries, rheumatic heart disease is most common.[13] So the present study was done to analyse the influence of cardiac disease on pregnancy with the following objectives.

- To assess the cardiac diseases in pregnancy.
- To analyze the effect of cardiac diseases on maternal and fetal outcome.

METHODS

The hospital based cohort study was conducted in the outpatient department of obstetrics and gynecology at Shri Vasantrao Naik Government Medical College Yavatmal, Maharashtra, India. The study was conducted for a period of five years from Jan 2011-Jan2016. During the study period 440 mothers with cardiac disease were identified during routine antenatal check-up. Out of 440 women who had heart disease, 30 aborted and 20 others were lost to follow up. So the final sample size was 390 in which fetomaternal outcome was analyzed. All the pregnant women who visited for routine antenatal check up were screened for cardiac disease were included in the study. Those who were having cardiac diseases were taken as study participants.

Institutional ethics committee permission was obtained. Informed consent was taken from every participant before starting the study.

Methodology

All the women who visited obstetrics and gynecology OPD for routine antenatal check-up were evaluated by the senior obstetrician as well as the physician for cardiac disease. Functional grading of the cardiac status was made at the first visit according to the New York heart association (NYHA) criteria considering the parity, gestation at first visit and disease status, appropriate counselling was given about continuation or termination of pregnancy with contraception/sterilization. Detailed clinical examination was done at each visit, for evidence of respiratory, lower genital and urinary tract infections and if any. Women are advised additional rest with regular antenatal advice. Those who were identified with underlying cardiac disease were followed up throughout there pregnancy to identify any adverse maternal and fetal outcome. A pre-designed and pre-tested questionnaire was used. The date was entered in MS Excel and analyzed with proportions

RESULTS

It was observed that majority of the study participants were suffering with mitral stenois (30%), followed by mitral regurgitation (25%) and mitral strenosis and regurgitation (12%). Among congenital heart diseases atrial septal defect was seen in 14% of the study participants compared to ventricular septal defect and tetralogy of fallot. In miscellaneous heart condition cardiomyopathy was seen in 5% of the particiapants (Table 1).

Among all the number of the study participants who were suffering with mitral stenosis in them 62% were in first gravida while 32 % were in second to fourth gravid which shows that most of them reported during there first pregnancy. Atrial septal defect (21%) and tetralogy of fallot (16%) was reported among only first gravid women. Eissenmenger's syndrome was also seen in first gravida women only. Complete heart block and cardiomyopathy were observed in first gravid as well in second to fourth gravid. Near about 68% of women with cardiomyopathy were observed in first gravida (Table 2).

Table 1: Distribution of the study participants with cardiac disease.

Cardiac disease	Frequency	Percentage
Rheumatic heart disease		
Mitral stenosis	118	(30%)
Mitral regurgitation	98	(25%)
Mitral stenosis+ mitral regurgitation	48	(12%)
Congenital heart disease		
Atrial septal defect	56	(14%)
Ventricular septal defect	21	(5%)
Tetralogy of fallot	16	(4%)
Miscellaneous		
Eissenmenger's syndrome	5	(1%)
Complete heart block	9	(2%)
Cardiomyopathy	19	(5%)
Total	390	100!

Table 2: Distribution of study participants with cardiac disease with parity.

Cardiac disease	Gravida		Total
	G1	G2-G4	
Rheumatic heart disease			
Mitral stenosis	81 (68%)	37 (32%)	118
Mitral regurgitation	48 (50%)	50 (50%)	98
Mitral stenosis+ Mitral regurgitation	18 (37%)	30 (63%)	48
Congenital heart disease			
Atrial septal defect	31 (55%)	25 (45%)	56
Ventricular septal defect	21 (100%)	00	21
Tetralogy of fallot	16 (100%)	00	16
Miscellaneous			
Eissenmenger's syndrome	05 (100%)	00	05
Complete heart block	4 (44%)	05 (56%)	09
Cardiomyopathy	13 (68%)	06 (32%)	19

Majority of the study subjects were falling into class-I (55%) as per NYHA guidelines which is followed by class-II (38%) and very few in class-III (5%) and class-IV (2%) respectively (Table 3).

All the pregnant women with underlying cardiac disease suffered with complications due to cardiac disease such as 4% were having pregnancy induced hypertension, 8%

were anaemic, 1% of the women were found to have abruption placenta.

Table 3: Classification of study participants as per NYHA.

NYHA classification	Frequency	Percentage
I	215	55%
II	147	38%
III	22	5%
IV	06	2%
Total	390	100%

Table 4: Maternal complications.

Complications	Frequency	Percentage
Non-cardiac		
PIH	15	(4%)
Anemia	28	(8%)
Abruptio placenta	02	(1%)
Cardiac		
Atrial fibrillation	03	(1%)
Congestive cardiac failure	04	(1%)
Pulmonary embolism	01	((1%)

Table 5: Perinatal outcomes.

Perinatal outcome	Frequency	Percentage
IUD	04	(1%)
Still Birth	01	(1%)
Small for gestational age	02	(1%)
Preterm with very low birth weight with birth asphyxia	03	(1%)
Small for date with disseminated intravascular coagulopathy with intraventricular haemorrhage	01	(1%)
Birth Asphyxia with meconium aspiration syndrome.	01	(1%)
Premature with respiratory distress syndrome	02	(1%)

Very few women died because of certain complications, atrial fibrillation (1%), congestive cardiac failure (1%) and pulmonary embolism (1%) (Table 4).There were few perinatal deaths because of cardiac disease complication pregnancy, such as IUD, still birth, small for gestational age, preterm with very low birth weight with birth asphyxia, small for date with disseminated intravascular coagulopathy with intraventricular haemorrhage, premature with respiratory distress syndrome. All the above mentioned contributed to 1%. The overall perinatal mortality was found to be 4% in the present study (Table 5).

DISCUSSION

In the present study it was observed that majority of the study participants were suffering with mitral stenois (30%), followed by mitral regurgitation (25%) and mitral strenosis and regurgitation (12%). Among congenital heart diseases atrial septal defect was seen in 14%, where as in another study it was seen the prevalence was high compared to present study were mitral stenosis was seen in (44.5%), 2 Mitral regurgitation 20.9%, mitral stenosis+mitral regurgitation 13.6%. In case of congenital heart disease.[14] Atrial septal defect was found in 7.3%, 2 ventricular septal defect 5.5%, 3 Eisenmenger's syndrome (0.9% respectively.[14] In one study done by Konar et al mitral stenosis was seen in 39% of the study participants which was higher than our study and atrail septal defect was seen in 25% and ventricular septal defect was seen in 20% of the study subjects.[15] In another study it was obsereved that 70% of the patients of heart disease was of rheumatic origin and rest 30% of the patients presented with congenital heart disease. Mitral stenosis was the commonest Rheumatic heart disease.[17]

Majority of the study subjects were falling into class-I (55%) as per NYHA guidelines which is followed by class-II (38%) and very few in class-III (5%) and class-IV (2%) respectively. The study results were similar one study in terms of NYHA classification 70.9% were in class-I, II-14.55% class-III10% and class-IV 3.64%.[14] In a study done by Konar et it was found that majority were in grade I and II (83. 27 %), III (15.30 %) and IV 04 (0.14 %).[15]

All the pregnant women with underlying cardiac disease suffered with complications due to cardiac disease such as 4% were having pregnancy induced hypertension, 8% were anaemic, 1% of the women were found to have abruption placenta, similar findings were seen in one study where anaemia was observed in 9.1% of the study participants which is similar to the present study and PIH was seen in 6.4% and abruptio placentae 1.8%.[14] Where as in one study done by Suman et al anemia was seen in 3% and PIH in 6% of the study subjects which is less than our study.[16] Cardiac complications such as atrial fibrillation, congestive cardiac failure and pulmonary embolism was seen in 1% of the study participants whereas ARF was found in 3%. Pulmonary thromboembolism in 4% and heart failure 6% which is higher than in our study.[14,16] In one study most common maternal complication was heart failure in 16.7% and maternal deaths was found to be 4.8% which was more than our study.

The overall perinatal mortality was found to be 4% in the present study such as IUD, still birth, small for

gestational age, preterm with very low birth weight with birth asphyxia, small for date with disseminated intravascular coagulopathy with intraventricular haemorrhage, premature with respiratory distress syndrome where as in another study it was found that 14% were still births.[16] In a study done by Godavari et al Intrauterine deaths was seen in 9.5% and 42.1% were preterm babies.

CONCLUSION

Proper screening of the pregnant women to rule out any cardiac disease is required. If timely intervention are taken to treat the pregnant women with cardiac disease the morbidity and mortality in mother and foetus can be prevented to a great extent. So health education and awareness about underlying cardiac diseases during pregnancy should be done through campaigns.

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