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A study on profile of Antenatal women with history of cardiac disease admitted to a tertiary care hospital

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Abstract

Cardiac diseases complicate 1-4% of pregnancies in women without pre-existing cardiac abnormalities. Cardiac disease in pregnant women can present a challenge to the obstetrician, cardiologist and neonatologist. The spectrum of cardiovascular disease is changing and varies between countries. At present, 0.2-4% of all pregnancies in western countries are complicated by cardiovascular disease. Present study is a prospective observational study considering inclusion and exclusion criteria, selected patients were counselled regarding the study. After obtaining valid consent, a pre-designed proforma was used. Detailed clinical history regarding the no of pregnancies, presence of cardiac illness, symptoms, treatment received was noted. Necessary obstetrical examination was done. Prevalence of cardiac disease in our study is 0.4%. The mean age of the study group of our study was 24.1years, 65% of the patients were aged between 20-24 years.

Keywords: Cardiac diseases, antenatal women, profile

Introduction

Pregnancy makes a significant demand on the cardiovascular system. About 15-52% of cardiac abnormalities are first diagnosed during routine antenatal examination or because of symptoms brought about by the physiological changes of pregnancy. The marked pregnancy induced anatomical and functional changes in cardiac physiology can have a profound effect on the underlying heart disease. The prevalence of previously undiagnosed maternal cardiac structural abnormalities is significantly increased in women with high midtrimester uterine artery Doppler resistance indice ^[1].

Cardiac diseases complicate 1-4% of pregnancies in women without pre-existing cardiac abnormalities. Cardiac disease in pregnant women can present a challenge to the obstetrician, cardiologist and neonatologist. The spectrum of cardiovascular disease is changing and varies between countries. At present, 0.2-4% of all pregnancies in western countries are complicated by cardiovascular disease. In the developed countries, because of a marked decline in the incidence of rheumatic heart disease, congenital heart disease accounts for most of the cardiac disease in pregnancy ^[2].

In under developed countries, anaemia is a major associated other causes of maternal deaths have shown a decline, heart disease complicating pregnancy has become an important cause of maternal mortality. Pregnant women with cardiac disease fall into two categories ^[3].

1. Those with diagnosed heart disease and under treatment even before becoming pregnant
2. Those with previously undiagnosed heart disease

Rheumatic heart disease still remains the commonest etiological factor for heart disease complicating pregnancy. It is because of frequent and repeated streptococcal infections in childhood especially in rural 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 the obstetrician for various reasons. Women having additional obstetrical complications further worsens the prognosis. In western countries, maternal heart disease complicates 1-3% of pregnancies and is the third common cause of maternal death during pregnancy. Heart disease is one of the 3 major indirect causes of maternal mortality in India ^[4].

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Methodology

Source of data and materials

The present study was conducted among the antenatal women admitted in the department of OBG with a previously diagnosed cardiac disease or diagnosed after admission during index pregnancy.

Inclusion criteria

1. All women admitted to the antenatal ward and labour room with previously diagnosed cardiac disease and women diagnosed during the index pregnancy
2. Women developing cardiac complications during puerperium

Exclusion criteria

Patients with cardiac disease receiving outpatient care

Present study is a prospective observational study considering inclusion and exclusion criteria, selected patients were counselled regarding the study. After obtaining valid consent, a pre-designed proforma was used. Detailed clinical history regarding the no of pregnancies, presence of cardiac illness, symptoms, treatment received was noted. Necessary obstetrical examination was done. Laboratory investigations included hb estimation, blood grouping, urine routine, urine culture, HIV, HBSAg, glucose challenge test, TSH, ASO titre. Chest x ray PA view wherever necessary was taken with an abdominal shield. Electrocardiography and echocardiography was done in all the

patients and the diagnosis was confirmed. Special investigations like blood urea, serum creatinine, uric acid, liver function tests, fundoscopy, BT, CT, coagulation profile were done in necessary cases. 2D ECHO of the newborns was done to detect undiagnosed cardiac lesions.

The mothers and the babies were followed up. Maternal outcome was defined as discharged or died. The perinatal outcome was defined in terms of mortality, presence of congenital heart disease or other anomalies in the offspring.

Results

Table 1: Cardiac disease on admission:

Cardiac disease on admission	N	%
No cardiac disease	10	13.2
RHD	41	53.9
CHD	17	22.4
Miscellaneous	8	10.5
Total	76	100

Table 2: Overall Cardiac disease:

Cardiac disease	N	%
Peripartum cardiomyopathy	10	13.2
RHD	41	53.9
CHD	17	22.4
Miscellaneous	8	10.5
Total	76	100

Table 3: Cardiac lesions among Rheumatic Heart Disease patients:

Cardiac lesions among Rheumatic Heart Disease	N	%
Mitral Stenosis	19	46.3
MR+AR	6	14.6
Mitral Regurgitation with Mitral valve prolapse	5	12.2
TR+MR	1	2.4
Tricuspid Regurgitation	1	2.4
Tricuspid Regurgitation with mild PAH	1	2.4
Mitral Regurgitation with Severe PAH	1	2.4
MS+AR+TR with Severe PAH	1	2.4
Mitral Stenosis with Severe PAH	1	2.4
MS+MR++AS+AR+TS+TR with Severe PAH	1	2.4
MS+MR++AS+AR+TS+TR	1	2.4
MS+MR+TR	1	2.4
MS+MR+TR+ Pulmonary HTN	1	2.4
Severe MR	1	2.4
Total	41	100.0

MS: Mitral Stenosis, AR: Aortic Regurgitation, TR: Tricuspid Regurgitation, PS: Pulmonary Stenosis, AS: Aortic Stenosis, TS: Tricuspid stenosis

Table 4: Cardiac lesions among Congenital heart disease:

Cardiac lesions among congenital Heart Disease	N	%
Eisenmenger syndrome	1	5.9
VSD	7	41.2
VSD with severe PAH	1	5.9
ASD	5	29.3
PDA	2	11.8
Pulmonary stenosis	1	5.9
Total	17	100

Table 5: Cardiac lesions among miscellaneous heart disease patients:

Cardiac lesions among miscellaneous heart Disease	N	%
IHD	2	25.0
Atrial fibrillation	1	12.5
Chronic pulmonary HTN	3	37.5
Dilated cardiomyopathy	1	12.5
Arrhythmia	1	12.5
Total	8	100

Table 6: Associated comorbidities with Rheumatic Heart Disease patients:

Associated comorbidities among Rheumatic Heart Disease patients	N	%
No specific comorbidities	23	56.1
Hypothyroidism	1	2.4
Severe anemia	6	14.6
Moderate anemia	6	14.6
Cardio embolic stroke with internal iliac artery thrombosis	1	2.4
Pulmonary stenosis	4	9.8
Total	41	100

Table 7: Associated comorbidities among congenital Heart Disease patients at the time of admission:

Associated comorbidities among congenital Heart Disease patients	N	%
No specific lesions	10	58.7
LRTI	1	5.9
TWINS	1	5.9
Epilepsy	1	5.9
Severe preeclampsia	2	11.8
RH Negative	2	11.8
Total	17	100.0

Table 8: Associated comorbidities among miscellaneous Heart Disease patients at the time of admission:

Associated comorbidities among miscellaneous Heart Disease patients	N	%
No specific lesions	4	50
Gestational HTN	1	12.5
Severe anemia	1	12.5
Epilepsy	1	12.5
Fever	1	12.5
Total	8	100

Discussion

Cardiac disease in the pregnancy is a major risk factor for maternal as well as neonatal morbidity and mortality. Women with cardiac disease require special evaluation before and throughout the pregnancy. Our study shows the maternal and fetal outcome of cardiac disease during pregnancy in our hospital which is a tertiary referral centre in Karnataka.

Table 9: Comparison of incidence of cardiac disease with previous studies

Study	Year	Prevalence of cardiac disease in pregnancy
Asghar <i>et al.</i> [5]	2005	0.98%
Indira <i>et al.</i> [3]	2006	0.43%
Devabhaktuni pratibha <i>et al.</i> [6]	2009	0.42%
P Sneha <i>et al.</i> [7]	2014	0.87%
Our study	2017	0.46%

Prevalence of cardiac disease in our study is 0.4% which was similar to the study done by Indira *et al.*, Devabhaktuni pratibha *et al.* But the prevalence is more in the study conducted by Asghar *et al.* and P Sneha *et al.* Teaching institute in our country, being the referral centres, may not truly reflect the actual prevalence. It is an important cause of maternal mortality in India.

The mean age of the study group of our study was 24.1 years, 65% of the patients were aged between 20-24 years. Which is almost similar to the study conducted by Nagamani G *et al.*, Vidyadhar B Bangal *et al.* and Indira *et al.*

About 23% of the patients fall in the category of age between

25-29 years and 8% above 30 years of age in our study similar to the study by P Sneha *et al.*

In our study primigravidas are slightly lower in number than multigravidas which was similar to the study conducted by Mangala *et al.* and Bagde *et al.* and T Nqayana *et al.* Where as in the study of Indira *et al.* primigravidas are more than multigravidas.

Table 10: Comparison of % of term pregnancy delivered

Study	% of Term pregnancies delivered
Arnaldo Rodriguez <i>et al.</i> [8]	77.4
T Nqayana <i>et al.</i> [9]	63.15
Our study	76.3

More than 75% of the patients delivered after completing 37 weeks of gestation which was almost similar to the study conducted by Arnaldo Rodriguez *et al.*

This indicator is determined by the severity of heart disease and the limitation degree it causes during pregnancy, which exponentially increase extremely severe obstetric morbidity if it could be correlated with the complications encountered in the study.

Table 11: Comparison of the dominant cardiac lesion

Study	Dominant lesion	% of the dominant lesion
Indira <i>et al.</i> [3]	RHD	80
Devabhaktuni pratibha <i>et al.</i> [6]	RHD	48.5
Konar <i>et al.</i> [10]	RHD	69
Salam S <i>et al.</i> [11]	RHD	56.6
Vidyadhar B Bangal <i>et al.</i> [12]	RHD	42
Mazhar <i>et al.</i> [13]	RHD	65.3
Bhatla <i>et al.</i> [18]	RHD	88
Our study	RHD	53.9

In almost all of the studies RHD being the dominant lesion. In our study it contributes to around 54% which was almost similar to the study conducted by Salam S *et al.* Where as some studies shows quite larger number of RHD being 69%, 80%, 88% respectively

Not only the Indian studies showing RHD as the predominant lesion, a study conducted in South Africa also showed the same percentage ranging from 71-84. In a study conducted in Pakistan the ratio of RHD to CHD is 3:1 in contrast to studies of affluent societies where CHD is the dominant lesion

Mitral stenosis was the predominant lesion in many studies accounting 69.6%, 89.2% respectively. In our study also MS was predominant lesion accounting for 60.3%.

Even though incidence of cardiac abnormalities in pregnancy remains unchanged but the contribution of the different causes of cardiac disease during pregnancy varies with study period and population. Our study shows RHD 2.5 times more common than CHD, and MS being the predominant lesion similar to other studies.

However the incidence of RHD in developed countries has been reduced greatly due to wide spread use of antibiotics against streptococcal infection causing rheumatic disease. Hence our study shows that there is still improper or no treatment to the girls suffering from streptococcal infection during adolescence or childhood.

The risks are increased in pregnant women with severe MS (mitral valve area <1.5 cm²), with moderate or severe symptoms prior to pregnancy, and with a diagnosis late in pregnancy. Patients with mitral or aortic regurgitation tolerate pregnancy

much better than patients with valvular stenosis.

In our study Anti streptolysin-O test done for RHD cases and found positive in 51.2% of cases and all RHD cases received penicillin prophylaxis at our hospital who were not previously received penicillin.

Isolated Mitral regurgitation in our study was found in around 12.2% which was in agreement with the study conducted by Konar *et al.* Mitral valve prolapse is the most common cause of Mitral regurgitation in women with pregnant and similar result found in our study.

The anticoagulant to use in pregnancy remains still controversy. In 1998, the American Heart Association recommended warfarin in patients from one to 35 weeks' gestation with older-generation mechanical prostheses. Newer low profile prostheses are associated with lower risk and adjusted-low dose subcutaneous heparin has been suggested. In a recent review, three regimens were recommended, namely, adjusted-dose low molecular weight heparin throughout pregnancy; aggressive adjusted-dose unfractionated heparin throughout pregnancy; and unfractionated heparin or low-molecular weight heparin until the 13th week, with a change to warfarin until 36 weeks, when heparin is restarted.

Conclusion

In our study, the incidence of cardiac disease in pregnancy is 0.46%. RHD is the commonest etiology followed by CHD. Mitral stenosis is the commonest lesion in RHD, while VSD is the commonest in CHD.

Conflict of Interest

Not available.

Financial Support

Not available.

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