Research Article
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Feto–maternal outcome in pregnancy with Heart Disease: A tertiary care centre experience

Abstract

Aim and Objectives: To know the prevalence and etiological types of heart disease in pregnant female and to describe the foetal and maternal outcome.

Methodology: A retrospective hospital based study of all women with congenital or acquired heart disease admitted in Safdarjung hospital in 2016 was performed. The etiological type of heart disease and maternal and neonatal outcome were evaluated.

Results: Median age of all the patients enrolled was 25yrs (19yrs–31yrs) which included mostly multigravida with POG from 28 to 41 weeks of gestation. Among all the patients 62% were unbooked. Rheumatic heart disease was most prevalent followed by congenital heart disease (13.6%) and Cardiomyopathy (13.7%). It was also found in the study that Instrumental Vaginal delivery was the preferred method. The fetal outcome was also evaluated and it was found that Pre term delivery, Low Birth weight and IUGR were main complications found in the mothers with heart disease which resulted in 27% NICU admissions and 5.1% neonatal mortality.

Conclusion: Cardiac lesions and pregnancy both may affect each other adversely. Joint care of obstetrician, cardiologist and anesthetist, avoidance of complications that add to the burden on the heart and compliance of the patient and her family to regular follow up will go a long way in ensuing a safe outcome for mother and fetus.

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Objective

I. To find out prevalence of heart disease in women delivering at tertiary care center in North India.

II. To find out type and grading of heart disease.

III. To evaluate maternal and neonatal outcome in patients with heart disease.

Introduction

The natural process of human development includes pregnancy and child birth and is affected by maternal a physiological change which occurs during pregnancy. These hemodynamic changes cause a significant burden on cardiovascular system and if patient has cardiac disease, there is exacerbation of symptoms and also the diseased heart is not able to adjust and eventually may lead to decomposition and fetal and maternal demise. The prevalence of heart disease is between 0.3–3.5%[1] and has been constant since decades, although there is a shift in the type of heart disease, congenital being more common in developed countries.[2] Whereas RHD is still the most common type in developing world and the main reason for the same being poor socioeconomic condition, overcrowding, high prevalence of streptococcal infection and lack of access to proper medical facilities.

Despite of changing management and advanced treatment there is high fetal and maternal morbidity and mortality. Actual risk depends on the type and severity of the cardiac disease, but overall it accounts for 1/3rd of maternal mortality.[3]

Thus a timely diagnosis and adequate treatment is required to prevent fetomaternal morbidity and mortality and all it needs is adequate awareness about the prevalence and severity of the disease and need for on time management, on part of their obstetrician.

Keeping this in mind this study was undertaken in a tertiary care hospital of India, to determine the fetomaternal outcome in pregnant patients with heart disease to increase knowledge about prevalence and severity of the disease, so proper management and timely intervention can be done.

Material and methods

A Retrospective study was done for the duration of 1 year from January 2017 to December 2017 in the department of Obstetrics and Gynaecology, VMMC & Safdarjung Hospital, New Delhi. The data was collected from hospital records after written permission from concerned authorities.

All the pregnant females with known or newly diagnosed cardiac disease who were admitted during the study duration were included in the study only after confirming the diagnosis of cardiac disease by ECG or 2D Echo.

Results

Total number of deliveries during the study period was 23,900 and among these 116 had cardiac disease, prevalence of cardiac disease being 0.48%. The average age of the women enrolled in the study was 25years and majority of the patients (62%) were unbooked. Among 116 patients, 74 were multigravida and rest were primigravida.

Most common type of cardiac lesion was RHD and among them MR+TR was most common (in 16 cases i.e 20% of RHD patients) followed by isolated MR (in 14 cases i.e 17.5%) and among all RHD cases 20% (24 cases) were post MVR(with maximum having bioprosthetic valve).

CHD was seen in 13.6% of cases, with half of them operated for the same in the past. 16 patients (13.7%) had cardiomyopathy, two (1.7%)

each with Leutembacher syndrome and Takayasu Aortoarteritis. (Table 1,2).

Table 1 Type of cardiac lesion

Type of lesion	No of cases
Rheumatic Heart Disease	56 (48%)
RHD (Post MVR)	24 (20%) Bioprosthetic valve-18 Mechanical valve-4 Balloon Mitral Valvotomy-2
Congenital (uncorrected)	8 (6.8%)
Congenital (corrected)	8 (6.8%)
Cardiomyopathy	16 (13.7%)
Takayasu Aortoarteritis (Concentric LVH)	2 (1.7%)
Leutembacher syndrome	2 (1.7%)

Table 2 Rheumatic heart disease

Type of lesion	No. (%)
MR+TR	16 (20%)
MR	14 (17.5%)
TR	12 (15%)
MR+MS+TR	8 (10%)
MR+AR	6 (7.5%)
MS	6 (7.5%)
MS+MR	4 (5%)
AR+MR+TR	4 (5%)
AR+TR	4 (5%)
AR+MR	4 (5%)
MS+AR+MR	4 (5%)
AR+MS+TR	2 (2.5%)
AR+MS	2 (2.5%)

60 patients were NYHA class I at the time of admission and 22 being in class IV. (Table 3).

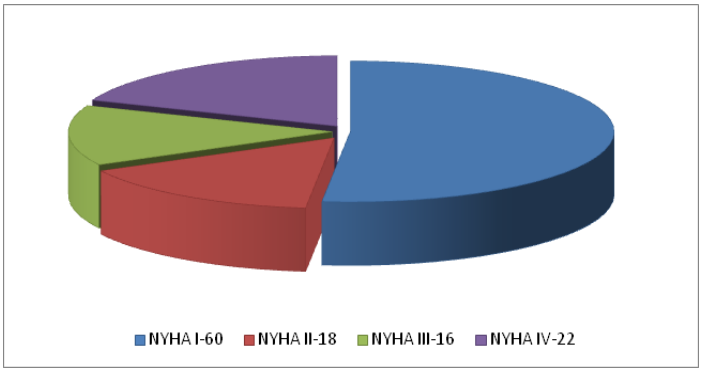

Table 3 NYHA class at admission

Obstetric outcome was studied and there were 64 vaginal deliveries, among which 42 were instrumental deliveries, rest being LSCS (52 in number), majority being due to obstetrical cause (44 in number). Irrespective of mode of delivery 60 patients delivered at term.

Maternal complications are demonstrated in table 4 with 20 patients landing in cardiac failure and 12 and 14 cases having PAH and Anemia respectively. 24 patients were admitted in HDU, with average duration of stay being 7days±2days mainly due to cardiac cause(in 18patients) followed by either Post LSCS for observation due to obstetric cause.

Table 4 Maternal complications

Complications	No. of cases
Cardiac failure	20
Anaemia	14
Pulmonary artery hypertension	12
Arrhythmias	4

There were 14 mortalities, all unbooked patients and the main cause was sudden cardiac arrest (in 8 patients) followed by pulmonary edema and cardiomyopathy in 4 patients and cardiogenic along with septic shock in two patients. Among these 6 presented with cardiac disease and 8 were diagnosed in the hospital.

Regarding perinatal outcome, there were 10 IUDs (8.6%), 28 LBW (24.1%), 32 had NICU stay (27.5%) and there were 6 neonatal deaths (5.1%). (Table 4,5)

Table 5 Perinatal outcome

Perinatal outcome		No. (%)
Low Birth Weight Babies		
•	Prematurity	22 (18.9%)
•	Foetal Growth Restriction	6 (5.1%)
IUD		10 (8.6%)
Causes of NICU Admissions		
•	Low Birth Weight	20 (17.2%)
•	APGAR < 7 at 1 minute	4 (3.4%)
•	For Observation	8 (6.8%)
Causes of Neonatal Death		
•	Extreme Prematurity	4 (3.4%)
•	Birth Asphyxia	2 (1.7%)
Total no of patients		116

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Table 6 and 7 demonstrates that unsupervised pregnancy has unfavorable maternal and fetal outcome.

Table 6 Unsupervised pregnancy has unfavorable maternal outcome

	Booked	Unbooked
Cardiac Complications	20	12
HDU Admissions	4	20
Maternal Mortality	0	14

Table 7 Unsupervised pregnancy has unfavorable fetal outcome

	Booked	Unbooked
IUD	0	10
Low Birth Weight	8	20
NICU Admissions	10	22
Neonatal Death	0	6

Discussion

Pregnancy is associated with hemodynamic and cardiovascular changes that can lead to clinical deterioration in patients with cardiac disease. The present study provides a contemporary assessment of maternal and neonatal complications in patients with cardiac disease and the prevalence is found to be 0.48%.

The prevalence varies in developed and developing countries due to different geographical locations, seasons and incidence of Rheumatic fever, varying between 0.2–3.6% in India, 1–3% in USA, 0.5–1.8% in London and 0.8% in South Africa. The prevalence in the present study was comparable to the one found in the study carried out by Konar in the year 2012 (Prevalence being 0.6%)[4] but was double than the prevalence in Jolian's study(0.2%).[5]

The relative number of different causes of heart disease varies with the study period, study population and their socioeconomic condition. The present study shows RHD to be 5 times more common than CHD, this is same as found in other recent studies.[6,7] The higher incidence of RHD in the developing world indicates inadequate antibiotic treatment for Streptococcal infection in childhood and adolescence. On the contrary incidence of CHD is increasing in developing world as more females are reaching child bearing age due to improved diagnosis and management.

It was also observed that 50% patients belonged to NYHA class I at the time of admission which is same as found in study by Yasmeen (i.e 55%)[8] but was lower than the one found by Pandey et al., (72%).[7]

Obstetrical outcome was also compared and it was observed that LSCS rate was same as found in previous studies varying from 32% to 45%[4–11] majority being due to obstetric cause. These are demonstrated in Table 8.

	LSCS (%)	Vaginal (%)
Devabhaktuni P. and colleagues[11]	37.61	62.39
Doshi HU and colleagues[9]	31.91	68.08
Yasmeen and colleagues[10]	35	62
Konar et al.,[4]	33	46
Jolien et al.,[5]	41	59
Pandey et al.,[7]	34	66
Patne et al.,[8]	45	47
Present study	44	55

High maternal morbidity was observed in the present study with CHF being most common followed by anemia and arrhythmia, their incidence by various authors is described below in the table, (8–10)

	CHF	Anemia	Arrhythmia
Jolien, et al.,[5]	10	–	–
Gahlot, et al.,[6]	16	–	4
Pandey et al.,[7]	19.6	40	–
Present study	17	12	3.4

Although embolism, CVA and Bacterial endocarditis were not seen in any of the patients enrolled in the present study. The high morbidity is due to high incidence of unsupervised pregnancy and emergency admissions in labor with complications. 20 HDU admissions among 24 being unbooked, whereas among 14 mortalities in the present study, all were unbooked patients with cardiac disease (8 were diagnosed after admission in the hospital) and the main reason being sudden cardiac arrest.

When mortality rate was compared with other studies, it was found to be higher, being 12% in the present study, in comparison to 5.1% in Pandey's study (10) and only 1% in Konar's and Jolien's study (7,8) and the main reason being unsupervised pregnancy and ignorance towards females regarding health issues adding on to low socioeconomic conditions , illiteracy and lack of advanced facilities at grass root level. Among total of 116 patients in the study, 86% had live births and among these 27% needed ICU admission and neonatal morbidity and mortality was found to be in similar range as in other Indian studies.

	Preterm	LBW	IUD	NICU admission	Mortality
Yasmeen, et al.,[10]	25	25	–	–	2.5
Gahlot, et al.,[6]	20	16	–	–	8
Panday, et al.,[7]	–	–	–	28	7.7
Patne, et al.,[8]	27	8.82	5.6	51.47	5.6
Present study	28	24.1	8.6	27	5.1

These neonates also have inherent risk of congenital heart disease, which is documented to be 3–5% in patients with cardiac disease in comparison to 1% risk in general population, but in the present study no such inherited neonatal cardiac disease was observed although 13.6% women suffered from congenital heart disease. The results are in conjunction with Konar et al study who did not found any inherited neonatal heart disease although 21.3% women enrolled in the study suffered from congenital type of cardiac lesion.[7]

Conclusion

Heart disease in pregnancy is associated with significant maternal and perinatal morbidity and mortality and thus a routine cardiac auscultation in addition to routine obstetric examination in all antenatal women should be done and any suspicion of heart disease should be confirmed by a cardiologist. Pre pregnancy diagnosis, councelling, routine antenatal supervision, delivery at an equipped center, early detection and management of cardiac failure throughout the course of pregnancy, labor and puerperium is of prime importance to determine the favorable maternal and fetal outcome in patients with heart disease.

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None.

Conflicts of interest

Authors declare that there is no conflict of interest.

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