Original Research Article

Obstetric outcome in pregnancies complicated by cardiac disease a study from a tertiary care hospital at Mysore South India

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Abstract

Background: Approximately 1-3% of pregnancies are complicated by cardiac disease. Maternal and neonatal morbidity may be significant and the management of these cases can challenge the entire team. This study aimed to assess the maternal and fetal outcomes in pregnancies complicated by cardiac diseases. **Material and Methods:** This was a cross-sectional prospective hospital based observational study conducted between October 2014 to June 2016. All pregnant women with cardiac disease attending outpatient department and labour ward were included. They were followed up during antenatal period, one week following delivery and at six weeks following delivery. Maternal outcome parameters such as congestive failure, pulmonary edema, pulmonary hypertension, thromboembolism, change of functional grading anderinatal outcome parameters such as live birth or Intrauterine death, small for gestational age, prematurity, need for intensive care admission, mean APGAR at first minute and mean birth weight were observed **Results:** Total Number of deliveries was 4346. Incidence of cardiac disease in pregnancy - 61cases (1.75%).Rheumatic Valvular Disease was found in 32(52.5%), followed by Congenital Heart Disease 24 (39.3%). Congestive Cardiac Failure complicated 4 (6.6%). Maternal outcome was better in women belonging to NYHA grade I and II 56 (91.8.%) and 3 (4.9%) respectively. Perinatal complications were observed in 8 (9.9%) of pregnancies. **Conclusions:** Rheumatic Heart Disease was leading cause of cardiac disease complicating pregnancies. Incidence of CHD was signiuficantly lower. Maternal outcome was good in women presenting with NYHA grade I and II category symptoms

Key Words: Gestation, Heart disease, Intrapartum.

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INTRODUCTION

Approximately 1-3% of pregnancies are complicated by cardiac disease.[1] With advances in medical care and surgical techniques, an increasing number of women with heart diseases are surviving into adulthood and seeking to start families[2]. Although pregnancy related maternal and neonatal mortality are low in this population, maternal and neonatal morbidity may be significant and the management of these cases can challenge the entire team providing care to the mother and fetus.[3] There is paucity of data regarding this from Karnataka. This study was taken up to study maternal and fetal outcome in pregnancies complicated by cardiac diseases.

MATERIAL AND METHODS

This was a cross-sectional prospective hospital based observational study conducted at JSS Hospital, a tertiary care teaching hospital between October 2014 to June 2016 at the Department of Obstetrics and Gynecology. Inclusion criteria for the study were 1) Pregnant women both booked and unbooked diagnosed to have cardiac disease. 2) Pregnant women incidentally diagnosed to

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have cardiac disease and those who developed cardiac disease in peripartum period were also included in the study. Informed valid consent was taken from patients before enrolling to study. They were followed up during antenatal period, one week following delivery, six weeks following delivery. Maternal and fetal outcome was studied. Maternal outcome parameters such as : 1.Cardiac complications like development of arrhythmias, Congestive Failure /pulmonary edema, pulmonary hypertension, thromboembolism, development of Transient Ischemic Attacks(TIA) 2.Shift of NYHA functional grading from NYHA I/ II to NYHA III /IV.3.Need for ICU admission and Perinatal outcome parameters such as :1.Live birth, IUD, Small for gestational age, prematurity, need for NICU admission, presence of Congenital Heart Defects.2.Mean APGAR at 1st minute3.Mean birth weight were studied. Routine antenatal investigations such as hemoglobin, thyroid proile, Oral Glucose Challenge test, urine microscopy, HIV and HbsAg were carried out and recorded. Special investigations which aided in diagnosis and stratification of risk index were carried out which included, electrocardiogram and echocardiography, chest X ray with shield in some cases. Data was collected in a predesigned proforma by taking the important variables for the objectives of the study. The appropriate statistical methods were employed to tabulate the results. Ethical clearance was obtained from the ethical committee of our institution to carry out the study.

OBSERVATIONS AND RESULTS

Total Number of Cardiac cases- 61 Total Number of deliveries-4346 Incidence of Cardiac disease in pregnancy - 61cases(1.75%) The 61 pregnant women included in the study belonged to various age groups ranging from 18-35 years. Most of the pregnant women were in the age group of 21-25 years 32 (52.5%). Table 1

Table 1: Age distribution

Age group(years)	Count	Column N %
<20	10	16.4%
21-25	32	52.5%
26-30	14	23.0%
>31	5	8.2%

There were more primigravida than multigravid pregnancies (34(55.7%) and 27 (44.3%) respectively).Table 2

Table 2: Parity distribution

Parity	Count	Column N %
Primi	34	55.7%
Multi	27	44.3%

The pregnant women included in the study were assigned a base line NYHA grading of class I, class II, class III or class IV depending on the severity of underlying cardiac disease. Most of the subjects belong to NYHA class I 56 (91.8%) and NYHA class II 3(4.9%). The NYHA grading distribution is depicted in Table 3

Table 3: NYHA functional grading

NYHA	Count	%
Grade I	56	91.8%
Grade II	3	4.9%
Grade III	2	3.3%

The Table 4 shows underlying cardiac conditions among the pregnant women included in this study. Rheumatic heart disease was the principal cardiac lesion 32 (52.5%) among the pregnancies with cardiac disease, while congenital heart disease 24 (31.66%) was the second most common cause.

Table 4: Maternal heart disease characteristics

Cardiac lesions	Count	%
RHD	32	52.5%
CHD	24	39.3%
MVP	2	3.3%
WPW	1	1.6%
CARDIOMYPATHY	1	1.6%
CAD	1	1.6%

Among 24 cases of CHD, 14 (58.3%) were uncorrected and 10 (41.7%) were corrected lesions Table 5

Table 5: Depicting status of Congenital Heart Disease

CHD	Count	%
Uncorrected	14	58.3%
Corrected CHD	10	41.7%

It was observed in the study that Atrial Septal Defect (ASD) was the most common congenital heart disease seen in 10 (70.8%) women followed by Patent Ductus Arteriosus (PDA) with or without ASD/VSD in 2 (8.3%) women. 10 (41.7%) women with CHD had corrected lesions, while uncorrected lesions were found in 14 (58%) women. Table 6.

Table 6: Lesions in Congenital Heart Disease

CHD	Count	Column N %
AS	1	4.2%
ASD	17	70.8%
BAV	1	4.2%
PDA	2	8.3%
TOF	1	4.2%
VSD	2	8.3%

In the study it was observed that the predominant type of valvular lesion in women with RHD was Mitral Stenosis in 21 (65.6%) followed by Mitral Regurgitation in 12 (37.5%) women. Many patients had a combination of the above conditions. MS with MR was found in 12 (24%) women Table 7

Table 7: Lesions in Rheumatic Heart Disease

Lesions in RHD	Number	
	Corrected	Not corrected
MS	2	19
MR	-	12
TR	-	3
AR	-	1
MVP	-	1
Total	**2**	**36**

Table 8 illustrates mode of delivery among the pregnancies. Of the 61 pregnancies 32 (53%) women delivered by caesarean section 27(44%) pregnancies by vaginal route, 2 (3%) instrumental delivery

Table 8: Mode of delivery

Mode of delivery	Count	Column N %
LSCS	32	52.5%
FTND	27	44.3%
Instrumental	2	3.3%

In the present study cardiac complications were noted in 4(6.6%) of pregnancies which are shown above. Among the cardiac complications pulmonary edema/CCF 4(6.6%) was the most common complication. One maternal death was documented due to peripartum cardiomyopathy Prophylaxis with antibiotics were used and infective endocarditis did not occur in any of the subjects Table 9

Table 9: Cardiac complications

Cardiac Complications	Count	Column N %
No	57	93.4%
Pulmonory edema/CCF	4	6.6%

Table 10 lists various obstetric complications documented in the present study. Obstetric complications were seen in 18 (30 %) of pregnancies.

Table 10: Obstetric complications

Obstetric complications	Count	Column N %
Nil	43	70.95
Previous LSCS	6	9.9%
ANEMIA	1	1.6%
bronchial asthma	1	1.6%
eclampsia	1	1.6%
GDM	1	1.6%
GDM with preeclampsia	1	1.6%
Gestational Hypertension	1	1.6%
IUGR	4	6.6%
postpartum hemorrhage	1	1.6%
Preeclampsia	1	1.6%

Maternal outcome were documented as Improved without ICU admission, ICU admission and maternal death due to cardiac complications. They are listed in Table 11. The mean duration of stay in the hospital was 8 ± 3.97 days

Table 11: Maternal outcome

Maternal outcome	Count	Column N %
Improved without ICU admission	53	86.9
ICU admission	7	11.5
Death	1	1.6

In the present study ICU admission present in 8(13%) of pregnancies which. One maternal death was documented due to peripartum cardiomyopathy. Table 12

Table 12: ICU admissions

ICU Admission	Count	Column N%
NO	53	86.9%
YES	8	13.1%

In the present study ICU admission during antenatal period seen in 3cases (37%), and 5cases (63%) during postpartum period Table 13

Table 13: Timing of ICU admission

Timing Of ICU Admission	Count	Column N %
Antenatal peroid	3	37.5%
Postpartum period	5	62.5%

Perinatal outcome characteristics in the present study included number of live births, IUD, IUGR, NICU admissions and congenital heart disease and prematurity. Mean APGAR score at first minute and mean birth weights were also documented. Among 61 pregnancies all pregnancies had live deliveries 61 (100%), and 2 (3.3%) prematurity was observed, 5 (8.2%) required NICU admissions. Mean APGAR score was 7.73 ± 0.83(mean ± SD) and the mean birth weight of the babies was 2.7Kg ± 0.4992 (mean ± SD) Tables 14, 15 and 16.

Table 14: Perinatal outcome

Perinatal outcome	Count	Column N%
Live birth	61	100
IUGR	2	3.3
Preterm Birth	2	3.3
NICU admission	5	8.2
Congenital Heart Disease	2	3.3

Table 15: APGAR SCORING

APGAR	Count	Column N %
5.00	2	3.3%
6.00	18	29.5%
7.00	31	50.8%
8.00	10	16.4%

Table 16: Infant Birth Weight

Infant Birth Weight	Count	Column N %
Normal Birth weight	50	82.0%
Low Birth weight	11	18.0%

DISCUSSION

Cardiac diseases complicate approximately 1-3% of pregnancies.[1] These women need appropriate pre pregnancy counselling regarding the risk of pregnancy

and neonatal outcome.[2] The course of pregnancy as well as maternal and fetal morbidity and mortality are dependent on both the underlying cardiac disesase and the functional maternal state.[3,4] In the presence of maternal heart disease, the circulatory changes of pregnancy may result in decomposition or death of the mother or fetus.[5] Prior cardiac surgery may not be completely free of pregnancy related complications because of the hemodynamic and electrophysiological residua.[6] Increasing number of women with heart disease are reaching adulthood as a result of advances in diagnosis and treatment of heart disease in childhood and adolescence. As these women contemplate pregnancy, they seek counseling regarding maternal and fetal outcome.[7] We prospectively studied sixty one pregnancies complicated by cardiac disease. In the present study, the demographic characteristics of the study group, prevalence of cardiac disease among pregnant women, NYHA functional grading, types of underlying cardiac diseases, cardiac complications encountered, mode of delivery, obstetric complication, maternal and fetal outcome were studied. Incidence of cardiac diseases in pregnancy**:** The incidence of cardiac diseases in pregnancy ranges from 1 to 3%.[1] The total number of deliveries in our hospital during the study period was 4346 deliveries. In the present study the incidence of cardiac disease was found to be 61(1.75%), which is comparable to the studies by Burlew BS *et al*[8] and Datta Ray *et al*[9] Pregnancy in women with heart disease is associated with considerable mortality and morbidity.[10] Thorough prenatal care and team approach involving obstetricians, cardiologists, anaesthesiologists and neonatologists can improve the maternal and fetal outcome in these women.[11] The course of pregnancy as well as maternal and fetal mortality and morbidity are dependent on both the type of underlying cardiac disease and the NYHA functional grading.[12,13] Rheumatic Heart Disease is still the leading cause of maternal heart disease during pregnancy in developing countries, while the incidence of congenital heart disease is on the rise**.** There are several strenghts of this study –The number of subjects studied is fairly large and all the cases were evaluated with the assistance of superspeciality department of cardiology available at our hospital. As far as the the limitations of this Study-A few Pregnant women with cardiac disease, unbooked cases, came in active labour and hence, initial NYHA grading could not be assessed. Management of pregnancies complicated by heart diseases requires a multidisciplinary team approach, and the management should be tailored to the specific needs of the patient.

CONCLUSIONS

From the present study we conclude that though pregnancy in women with heart disease is associated with considerable mortality and morbidity, thorough prenatal care and team approach can improve the maternal and fetal outcome in these women. RHD was found to be the leading cause of maternal heart disease during pregnancy in our study.

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