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Original Research Article

## The maternal and perinatal outcomes in heart disease in pregnancy in a tertiary care hospital

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### ABSTRACT

**Background:** The incidence of cardiac diseases in pregnancy ranges from 1 to 3%. Pregnancy in women with heart disease is associated with considerable mortality and morbidity. Thorough prenatal care and team approach involving obstetricians, cardiologists, anaesthesiologists and neonatologists can improve the maternal and fetal outcome in these women. Rheumatic heart disease is still the leading cause of maternal heart disease during pregnancy in developing countries.

**Methods:** Between February 2022 and August 2022, a retrospective research at the RL Jalappa Hospital in Kolar was carried out. Out of 764 deliveries made at the facility throughout the study period, 30 singleton pregnancies complicated with heart disease admitted department of obstetrics and gynaecology at different periods of gestation. The maternal and perinatal outcome was thus noted.

**Results:** Out of 764 deliveries, 30 women were found to have been complicated with heart disease. Overall incidence was 3.9%. Rheumatic heart disease was the most common heart disease seen among them. The most common congenital heart disease present was atrial septal defect (ASD). The most common cause for LSCS was fetal distress. 93.3% of the babies delivered were shifted to NICU, with the most common cause being, preterm and low birth weight. No maternal mortality seen, though 1 neonatal mortality present due to extreme low birth weight.

**Conclusions:** A multidisciplinary team approach including obstetrician, cardiologist, pediatrician and anesthesiologist is needed in the cases of pregnancy with heart disease to determine the mode of delivery, timing of delivery, change in anticoagulant drugs in pregnancy, type of anesthesia, care of neonate, and follow-up of mother for better maternal and fetal outcomes.

**Keywords:** Atrial septal defect, LSCS, Mitral stenosis, Mode of delivery, Preterm, Rheumatic heart disease, Vaginal delivery

### INTRODUCTION

The prevalence of heart disease in pregnancy varies from 3-3.5% thereby complicating 1-4% of pregnancies in India.<sup>1</sup> According to the National Care for Health Statistics 2012, half of women aged more than 20 years have at least 1 risk factor for cardiovascular disease. Physiological changes of hemodynamics that occur in pregnancy are a volume expansion of plasma (above 50%) increased cardiac output (30-50%) along with a six-fold increased

risk of thrombosis. In women with normal cardiac reserve hemodynamics changes of normal pregnancy are well tolerated. However, decompensation occurs in diseased heart with resultant increase in maternal mortality and morbidity.<sup>2</sup> An early antenatal diagnosis of the cardiac disease, with precise multidisciplinary approach involving a collaboration of obstetrician, cardiologist, anesthetist and pediatrician can bring out excellent results in majority of the cases.<sup>3</sup>

## METHODS

Between February 2022 and August 2022, a retrospective research at the RL Jalappa Hospital in Kolar was carried out. Out of 764 deliveries made at the facility throughout the study period, 30 singleton pregnancies complicated with heart disease admitted department of obstetrics and gynaecology at different periods of gestation. Permission was obtained from the institution's ethics committee. All study participants provided their written informed consent. Included in our study were all pregnant women with congenital or acquired cardiac lesion or delivered patients with heart disease who were referred to our hospital. Women with associated medical disorder like diabetes mellitus, pulmonary disease, renal disease or any other endocrinological disease were excluded from this study. A structured detailed proforma was used to gather the essential information regarding heart disease in pregnancy. Baseline data recorded included were age, parity, gestational age, cardiac medications, thorough clinical examination including chest and cardiovascular auscultation, ECG and 2D echocardiographic assessment of left and right ventricular systolic function. Modern therapeutic measures, good referral system and timely advice of physicians and cardiologists was taken. All the patients were monitored for development of any cardiac lesion (congestive cardiac failure, arrhythmia, thromboembolisms, infarctions, endocarditis) or obstetric complications. The mode of delivery whether vaginal, use of instruments and the need for cesarean delivery was duly recorded. During the postnatal period, all patients were followed up till discharge for any obstetrical, cardiac and neonatal complications. At the time of discharge patients along with their spouses were counselled regarding the various contraceptive methods. All the patients were persuaded to continue the cardiac management after delivery.

### Data collection and analysis

Data were entered into MS Excel and analysed by using SPSS software, version.22. Every piece of quantitative data was examined using Mean and Unpaired t-test and the standard deviation. For nominal data frequency, percentage and chi-square test was applied. P value <0.05 was taken as a statistically significance of given variables.

## RESULTS

Out of 764 deliveries, 30 women were found to have been complicated with heart disease. Overall incidence was 3.9%. 13 patients, 43.33% belonged to age group of 21 and 25 years (Table 1) and majority (18) patients were primigravida (60%) (Table 2). Majority common cardiovascular problem found in these patients was rheumatic heart disease, which accounted to 18 patients a total of 60%. Out of which mitral stenosis was found to be most common. Of which 9 patients (31%) had congenital heart disease, out of which ASD was common in 6 patients (20%) (Table 3).

**Table 1: Distribution of subject according to age group.**

Age (years)	Frequency	Percent
<20	7	23.3
21-25	13	43.3
26-30	8	26.7
>30	2	6.7
<b>Total</b>	<b>30</b>	<b>100.0</b>

**Table 2: Distribution of subject according to gravida.**

Variables	Frequency	Percent
<b>Primi gravida</b>	18	60
<b>Multi gravida</b>	12	40
<b>Total</b>	<b>64</b>	<b>100.0</b>

**Table 3: Distribution of subject according to cardiac conditions.**

Variables	Frequency	Percent
<b>ASD</b>	6	20
<b>VSD</b>	2	6.7
<b>RHD</b>	18	60
<b>MVP</b>	1	3.3
<b>Dilated cardiac myopathy</b>	2	6.7
<b>Pulmonary artery hypertension</b>	1	3.3
<b>Post surgery</b>	5	17

**Table 4: Distribution of subject according to maternal outcome.**

Variables	Frequency	Percent
<b>LSCS</b>	15	50
<b>Vaginal delivery</b>	15	50
<b>Total</b>	<b>30</b>	<b>100.0</b>

One case had pulmonary hypertension with pulmonary pressure of 25 mmHg (confirmed by 2D ECHO). This patient presented with dyspnoea at term gestation, and was admitted in ICU with NYHA score 3. The second ICU admission was for pulmonary edema and peripartum cardiomyopathy. In our study there was no maternal mortality. All these women were categorised between NYHA class I and NYHA class 3. 2 patients out of 30 were booked and rest were unbooked cases. Among the 15 vaginal deliveries, 10 had spontaneous vaginal delivery. 5 had instrumental vaginal delivery. 3 patients were induced with foleys catheter. 15 cases had caesarean delivery (LSCS), under spinal anesthesia and the most common indication was fetal distress (Table 4). Prophylactic antibiotics against bacterial endocarditis was given to all patients. One neonatal death due to very early preterm delivery (29 weeks). The neonatal complications that we faced were, 28 (i.e.) 93.3% of the babies were admitted to NICU. 18 babies (60%) had low birth weight (baby birth weight <2.5 kg) and 8 babies (26.6%) were preterm (Table

5). Among the others, obstetric complications that were seen in this study were, 2 cases of pregnancy induced hypertension and hemolytic anemia accounting to 6.66% each. Fetal growth restriction present in 4 cases (13.2%) (Table 6).

**Table 5: Perinatal outcome.**

Variables	Frequency	Percent
Neonatal death	1	3.3
Congenital anomaly (Non-cardiac)	1	3.3
ICU admissions for the mothers with intrapartum cardiac failure	2	6.7
NICU admissions	28	93.3
Low birth weight	18	60
Prematurity	8	26.66
Birth asphyxia	2	6.66
Stillbirth	0	0

**Table 6: Obstetric complications.**

Variables	Frequency	Percentage
Anemia	2	6.66
Preterm	18	60
PPROM	2	6.66
Oligohydramnios	2	6.66
Pregnancy induced hypertension	2	6.66
Fetal growth restriction	4	13.2

## DISCUSSION

The incidence of heart disease complicating pregnancy has been found upto 3.9% in this study which is relatively higher than most of the study incidence. However, the lowest incidence reported is 0.42% in Devabhaktuni study and highest incidence was reported in Vidhyadhar study. The average age distribution in this present study was between 21 and 25 years, was found similar in the study by Indira et al and from 20 to 24 in the study by Konar et al.<sup>4,5</sup> In 2018, the average age was determined to be between 28.81 and 31.2 years old, as per the European Society of Cardiology's guidelines for the management of CVD during pregnancy.<sup>6</sup> Here most of the cardiac disease were found in the primigravidas, whereas, research done by Sneha et al (58.3%) has found its prevalence in multigravidas.<sup>7</sup> Most of the women with cardiac disease belonged to NYHA class 1 (76.7%), except of 2 patients one of pulmonary hypertension and one with pulmonary edema and peripartum cardiomyopathy, who presented with NYHA score 3 In studies done by Indira et al, Bangal et al, Sneha et al, and Nagamani et al most women belonged to NYHA class 1.<sup>5-8</sup> "It is found that rheumatic heart disease is the most common valvular heart disease especially in low to middle-socioeconomic countries" as described by the European Society of Cardiology.<sup>9</sup> In our

study, the most common valvular lesion was mitral stenosis (44.4%) followed by mitral regurgitation (31.5%). This was comparable with a study conducted by Bangal et al (40%), Sneha et al (22%), Konar et al (38.5%), and Nagamani et al (54%).<sup>4,5,7,8</sup> All of them had mitral stenosis as the predominant valvular lesion. Cardiac failure was the most common complication found in a study done Indira et al (25%) and Konar et al (74%).<sup>4,6</sup> Maternal complications can be prevented by regular antenatal checkups, regular cardiac monitoring, and timely hospitalization when symptoms worsen. Maternal mortality in other studies was, 6.6% (Indira et al), 2.79% (Sneha et al), and 1.1% (Konar et al).<sup>5-7</sup> Hsiesh et al in their study reported that out of fetomaternal deaths 75% patients were in NYHA class 3 and 4.<sup>10</sup> No maternal deaths were noted in the study done by Bangal et al.<sup>5</sup> In our study there were no maternal deaths. 1 neonatal death due to extreme preterm present. Therefore, the fact that pre-pregnancy diagnosis, routine antenatal checkup, timely reference, and delivery at an equipped center is required for the better maternal and neonatal outcome.

## CONCLUSION

A multidisciplinary team approach including obstetrician, cardiologist, pediatrician and anesthesiologist is needed in the cases of pregnancy with heart disease to determine the mode of delivery, timing of delivery, change in anticoagulant drugs in pregnancy, type of anesthesia, care of neonate, and follow-up of mother for better maternal and fetal outcomes.

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