

Feto-Maternal Outcome in Cardiac Diseases during Pregnancy at VIMS Ballari - A Retrospective Study

Dr. Chandrashekhar T¹, Dr. Praveenkumar², Dr. Reshma³, Dr. H Shivprakashgouda L Horapeti⁴

¹Professor, Department of Obstetrics and Gynaecology, Vijayanagara Institute of Medical Sciences, Ballari-583104, Karnataka, India

Email: [cstobg\[at\]gmail.com](mailto:cstobg[at]gmail.com)

Mobile No.9448795069

²Junior Resident, Department of Obstetrics and Gynaecology, Vijayanagara Institute of Medical Sciences, Ballari-583104, Karnataka, India

Email: [praveenyadgir126\[at\]gmail.com](mailto:praveenyadgir126[at]gmail.com)

Mobile No.7353510346

³Junior Resident, Department of Obstetrics and Gynaecology, Vijayanagara Institute of Medical Sciences, Ballari-583104, Karnataka, India

Email: [reshmapatild\[at\]gmail.com](mailto:reshmapatild[at]gmail.com)

Mobile No.8150904751

⁴Junior Resident, Department of Obstetrics and Gynaecology, Vijayanagara Institute of Medical Sciences, Ballari-583104, Karnataka, India

Mobile No.7406273050

Email: [lhshivprakash999\[at\]gmail.com](mailto:lhshivprakash999[at]gmail.com)

Abstract: ***Introduction:** Cardiac disease in pregnancy is a high-risk pregnancy, which possess a significant challenge to an obstetrician, cardiologist, and neonatologist. It is considered as one of the important concerns resulting in maternal mortality and morbidity in the antenatal and postnatal periods. Hence our study to evaluate feto-maternal outcomes in pregnancy with cardiac disease. **Materials and Methods:** The present study is a retrospective study conducted in the department of Obstetrics and Gynecology, Vijayanagara Institute of Medical Sciences, Ballari from 1st January 2020 to 30th June 2021. The objective of the study was to determine feto-maternal outcome in pregnant women with heart disease in terms of fetal complications and maternal complications. The information about 30 pregnant women with heart disease which were previously established or diagnosed during pregnancy was collected from the MRD of the hospital, which was carefully studied and analyzed. **Results:** In our study prevalence of CHD was 23.3% and that of RHD was 43.3%. In other type of heart diseases, majority of the women i.e., 3 (10%) had peripartum cardiomyopathy and 2 each had pericardial effusion and mild MR. NYHA type I and II were most common i.e., 9 (30%) followed by type IV in 7 (23.3%) and type III in 5 (16.7%) Mode of delivery was LSCS in 14 i.e., 46.7% women, vaginal delivery in 13 (43.3%) and instrumental in 3 (10%) women. Maternal death rate in our study was 16.7%. Fetal death rate in our study was 13.3%. There is strong association between type of heart disease and maternal death as well as between type of heart disease and newborn/fetal death in our study ($p < 0.05$). **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, counselling, routine antenatal supervision, delivery at an equipped Centre, 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.*

Keywords: Heart disease, NYHA, CHD, RHD.

1. Background

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. 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. 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.² About 15-52% of cardiac abnormalities is first diagnosed during routine antenatal examination or because of

symptoms brought about by the physiological changes of pregnancy. Responsible for 10-15% of maternal death and is the leading cause of maternal death internationally.³ Cardiac disease in pregnancy is broadly divided into congenital and acquired. The acquired group includes RHD, cardiomyopathies and ischemic heart disease. Heart disease in pregnancy increases the maternal mortality.⁴ Cardiac disease in pregnancy is a high-risk pregnancy, which possess a significant challenge to an obstetrician, cardiologist and neonatologist. It is considered as one of the important concerns resulting in maternal mortality and morbidity in the antenatal and postnatal periods.⁵ Hence, we planned this study with the objective to evaluate feto-maternal outcomes in pregnancy with heart disease.

2. Materials and Methods

The present study is a retrospective study conducted in the department of Obstetrics and Gynecology, Vijayanagara Institute of Medical Sciences, Ballari from 1st January 2020

to 30th June 2021. The objective of the study was to determine fetomaternal outcome in pregnant women with heart disease in terms of fetal complications and maternal complications. The information about 30 pregnant women with heart disease which were previously established or diagnosed during pregnancy was collected from the MRD of the hospital. A structured detailed proforma was used to gather essential information regarding heart diseases in pregnancy. Baseline data recorded included were age, parity, gestational age, cardiac lesions, use of cardiac medications, through clinical examination including chest and cardiovascular auscultation and classified according to NYHA functional class and Diagnosis was confirmed by ECG and echocardiograph assessment of left and right ventricular systolic function. The mode of delivery whether vaginal, instrumental or LSCS were recorded. Neonatal outcome recorded in term of Birth weight, Maturity, and admission to NICU, Intrauterine growth restriction, Perinatal mortality, which was carefully studied and analyzed

Inclusion criteria:

- All Pregnant women (Booked and Unbooked Cases) diagnosed of having heart disease either before or during pregnancy
- Reported to labour room in third trimester

Exclusion criteria:

- I trimester termination of pregnancies
- Severe anemia

3. Results

- In our study, out of 30 women, majority of them were from 21-25 years age group i. e.11 (36.7%) followed by 10 (33.3%) from 26-30 years, 5 (16.7%) from 31-35 years and least were from less than 20 years age group i. e.13.3%
- Majority of the women were multigravida i. e.22 (73.3%) and remaining i.e. 8 (26.7%) were primigravida
- Risk factor evaluation revealed that in 10 (33.3%) women had severe preeclampsia followed by 7 (23.3%) had previous LSCS, 3 (10%) had gestational diabetes and 2 each i. e.6.7% had mild preeclampsia and post-dated pregnancy
- Mode of delivery was LSCS in 14 i.e. 46.7% women, vaginal delivery in 13 (43.3%) and instrumental in 3 (10%) women.
- Out of 14 women who underwent LSCS, majority had scar tenderness i.e. 7 (23.3%) and in remaining cases indication was uncontrolled HTN, CPD, Fetal distress, Non-reassuring FHR, Placenta previa type IV, Prev.2 LSCS in labour and Primi breech in 1 patient each i.e. 3.3%

Table 1: Distribution according to type of heart disease

Type of heart disease	Frequency	Percent
CHD	7	23.3
RHD	13	43.3
Others	10	33.3
Total	30	100.0

Table 2: Distribution according to type of RHD

Type of RHD	Frequency	Percent
Nil	17	56.7
Corrected MVP, Moderate AR, Dilated LA, Mild TR, PH	1	3.3
Mild MR, Moderate to severe TR	2	6.7
Mild TR + Mildly dilated RA RV	2	6.7
MS + Corrected MS (Mitral Valvuloplasty) + Mild TR Mild MR	1	3.3
MS, MR	2	6.7
MVP + Corrected MS (Mitral Valvuloplasty)	1	3.3
MVP, Mild MR	1	3.3
Post Mitral Valve Commissurotomy, Moderate MR, Mild AR, Mild TR	1	3.3
Severe MR, Severe TR	1	3.3
Severe MS	1	3.3
Total	30	100

Table 3: Distribution according to type of CHD

Types of CHD	Frequency	Percent
ASD	1	3.3
VSD	2	6.7
Corrected ASD	2	6.7
Corrected VSD	2	6.7
No CHD	23	76.7
Total	30	100.0

Table 4: Distribution according to other heart disease

Other Heart Disease	Frequency	Percent
Severe TR, MVP	1	3.3
Anterior Mitral Valve Prolapse	1	3.3
Dilated Cardiomyopathy	0	0.0
Dilated RA RV, Severe TR, Mild LV dysfunction	1	3.3
Mild MR	2	6.7
Mild MR, Mild TR	1	3.3
Mild MR, Trace TR	1	3.3
Mildly dilated RA, Severe MR, Global LV hypokinesia	1	3.3
Moderate MR, Moderate TR	1	3.3
Moderate MR, MVP, Dilated LA	1	3.3
Pericardial effusion	2	6.6
Peripartum Cardiomyopathy	3	10.0
Nil	15	50.0
Total	30	100.0

Table 5: Distribution according to maternal complications

Maternal complications	Frequency	Percent
Arrhythmia	2	6.7
CCF	7	23.3
PAH	3	10.0
Pulmonary Edema	2	6.7
Uneventful	16	53.3
Total	30	100.0

Maternal death rate in our study was 16.7% (5 out of 30 women)

Table 6: Distribution according to fetal complications

Fetal complications	Frequency	Percent
LBW	3	10.0
MAS	5	16.6
Respiratory Distress	3	10.0
Prematurity	3	10.0
Nil	16	53.3
Total	30	100.0

Fetal death rate in our study was 13.3% (4 out of 30 babies)

Table 7: Association between type of heart disease and maternal outcome

Maternal outcome	Type of heart disease						Total
	CHD		RHD		OTHERS		
	No	%	No	%	No	%	
Death	0	0.0	1	7.7	4	40.0	5
Survived	7	100.0	12	92.3	6	60.0	25
Total	7	100.0	13	100.0	10	100.0	30

Chi square test-6.07, p-0.048 (<0.05), Significant

Total 5 maternal deaths were observed in our study. Out of 13 patients of RHD, only one maternal death attributed to it i.e. 7.7% whereas remaining 4 deaths were attributed to other causes of maternal heart diseases i.e. 40%. So there is strong association between type of heart disease and maternal death in our study (p<0.05)

Table 8: Association between type of heart disease and fetal outcome

Fetal outcome	Type of heart disease						Total
	CHD		RHD		OTHERS		
	No	%	No	%	No	%	
Death	0	0.0	0	0.0	4	40.0	4
Survived	7	100.0	13	100.0	6	60.0	26
Total	7	100.0	13	100.0	10	100.0	30

Chi square test-9.23, p-0.010 (<0.05), Significant

Total 4 fetal deaths were observed in our study. All 4 newborn deaths were attributed to other causes of maternal heart diseases i.e. 40%.

So there is strong association between type of heart disease and newborn death in our study (p<0.05)

4. Discussion

Cardiac disease in pregnancy contributes a major risk factor for maternal and perinatal morbidity and mortality. The incidence of congenital heart disease in pregnancy has come down due to advanced surgical repair technique, but in countries like India both the incidence of congenital and rheumatic heart disease is still high due to poor socioeconomic status, ignorance about symptoms and negligence about own health. We included total 30 women in our study. Majority of them were from 21-25 years age group and multigravida 22 (73.3%). Prevalence of CHD in our study was 23.3% and that of RHD was 43.3%. Out of 7 CHD patients, 2 each were diagnosed as having VSD, corrected VSD and corrected ASD and 1 woman had ASD. So overall prevalence of VSD, corrected VSD and corrected ASD was 6.7% each and that of ASD was 3.3%.

In our study, 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). The prevalence varies in developed and developing countries due to different geographical locations, seasons and incidence of Rheumatic fever.

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 3 times more common than CHD, this is same as found in other recent studies. In our study, NYHA type I and II were most common i.e. 9 (30%) followed by type IV in 7 (23.3%) and type III in 5 (16.7%). Mode of delivery was LSCS in 14 i.e. 46.7% women, vaginal delivery in 13 (43.3%) and instrumental in 3 (10%) women. Majority being due to obstetric causes. In our study, maternal complications were seen in the form of CCF in majority of women i.e. 7 (23.3%) followed by PAH in 3 (10%) and arrhythmia and pulmonary edema in 2 cases each i.e. 6.7%. Maternal death rate in our study was 16.7% This result was comparable with Indira et al⁷ and Behera R et al.⁸ It was found to be higher, 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. In our study, fetal death rate in our study was 13.3%. In our study, fetal complications were seen in the form of MAS in majority of new-borns i.e. 5 (16.6%) followed by LBW, prematurity and respiratory distress in 3 (10%) each.

5. 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, counselling, routine antenatal supervision, delivery at an equipped centre, early detection and management of cardiac failure throughout the course of pregnancy, labor and puerperium is of prime importance to determine the favourable maternal and fetal outcome in patients with heart disease.

References

- [1] Heart diseases during pregnancy. Williams 24th edition, 49: 973.
- [2] ACOG committee opinion. Safety of Lovenox in pregnancy. Number 276, October 2002. Committee on Obstetric Practice. Int J Gynaecol Obstet.2002; 79 (3): 299–300
- [3] Uebing A, Steer PJ, Yentis SM, Gatzoulis MA. Pregnancy and congenital heart disease. British Medical Journal.2006; 332: 401-6.
- [4] Zipes DP, Braunwald E. Pregnancy & Heart Disease. In: Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine. Saunders Elsevier, 2008
- [5] Goldstein SA, Ward CC. Congenital and Acquired Valvular Heart Disease in Pregnancy. CurrCardiol Rep.2017 Aug 24; 19 (10): 96.
- [6] Panday K, Verma K, Gupta S, et al. Study of pregnancy outcome in women with cardiac disease: a retrospective analysis. International journal of reproductive contraception.2016; 5: 3537–3541.
- [7] Anubhuti Mohan, Usha Mohan, Rahul Singla, Pratima Mittal, Divya Pandey, Rekha Bharti. Feto-maternal outcome in pregnancy with heart disease: A tertiary care

centre experience MOJ Women's Health.2020; 9 (2): 59-62.

- [8] Behera R, Moharana JJ. Maternal and fetal outcome in cardiac disease in pregnancy: a retrospective study at tertiary care center. Int J ReprodContraceptObstetGynecol 2018; 7: 4399-402.
- [9] Indira I, Sunitha K, Jyothi. Study of pregnancy outcome in maternal heart disease. IOSR J Dental Med Sci.2015: 14: 6-10.