

ORIGINAL RESEARCH**Clinical Study of Maternal and Perinatal Outcome in Heart Disease Complicating Pregnancy at Tertiary Referral Center****Malathi Jonna¹, Akila B², Vanajakshamma Velam³**¹Associate Professor, Department of Obstetrics and Gynecology, SVIMS, SPMCW, AP, India²Assistant Professor, Department of Obstetrics and gynecology, SVIMS, SPMCW, AP, India³Professor, Department of Cardiology, SVIMS, AP, India**ABSTRACT**

Background: Cardiac disease is an important cause of maternal mortality and morbidity both in ante partum and postpartum period. The overall incidence of heart disease in pregnancy is <1%. **Objective of present study** was to determine maternal outcome in pregnant women with heart diseases in terms of fetal complication, maternal complication and Mode of delivery. **Aims:** The aim of this study is to evaluate the influence of biological factors in Perinatal Outcome in Heart Disease Complicating Pregnancy.

Materials and Methods: This study was conducted between January 2018 to December 2021, in a tertiary care centre, SVIMS, Sri Padmavathi Medical college for women. It is a retrospective observational study. Sample size is 55.

Results: In the present study, age distribution varied from 20-40 yrs. majority of women (52.72%) are in the age group 20-25 years, followed by 23.63% in the age group of 26-30 years, 12.72% in the age group 31-35 years and 1.81% in the age group 36-40 years. 90.90% of cases are booked cases and 9.10% of cases are booked cases.

Conclusion: Preconceptional counselling, accurate risk assessment, regular antenatal checkups, prevention, early recognition and aggressive treatment of complications during pregnancy are crucial in reducing their morbidity. Surgical correction of the cardiac lesion prior to pregnancy is associated with better pregnancy outcome.

Keywords: Heart Disease, Pregnancy, Preconceptional counseling, postpartum period.

Corresponding Author: Dr. Malathi Jonna, Associate Professor, Department of Obstetrics and Gynecology, SVIMS, SPMCW, AP, India.

INTRODUCTION

Pregnancy causes a significant burden on cardiovascular system due to hemodynamic changes therefore a diseased heart may not be able to adjust with extra load resulting in heart failure and even maternal mortality. Actual risk depends on the type and severity of the particular heart disease. Cardiac disease complicates 1% to 4% of pregnancies. Despite of continuous advancement in treatment and management of cardio-vascular diseases, it accounts for one third of maternal mortality along with it increases the risk of adverse maternal and foetal outcome.^[1] With the availability of modern surgical facilities and advances in medical management (due to advanced equipment and better drugs) along with intensive maternal and fetal monitoring the scenario has quite changed. 22% of the population are constituted by women of child bearing age of 15-45 years in India. They are a vulnerable risk group which is due to pregnancy and child bearing. Pregnancy and child birth are physiological processes and a woman is the only person who can come across a number of health related problems when pregnant and it can also lead to death. All these deaths occur in the developing countries where integrated health care system are not well organised.

Developing countries of Asia and Africa have the highest mortality rate i.e. 99% of total maternal mortality. The key factors contributing the adverse maternal and perinatal outcomes are lack of trained birth attendants, lack of education, low status of women in society, poor families, financial dependency of women, and delay in seeking medical treatment. A study showed that 92% of maternal deaths are due to delay in referral and case management, first delay in making decision to seek care, 2nd delay is due to delay in identifying and reaching a medical facility, 3rd delay is due to delay in receiving adequate and prompt treatment even after reaching a care institution^[1-4]

This study was done with the aim to assess the maternal and fetal outcomes in patients of heart disease.

MATERIALS & METHODS

This is a Retrospective observational study conducted in pregnant women with cardiac disease who attended SVIMS, Sri Padmavathi Medical college for women between January 2018 to December 2021. Ethical clearance obtained.

Inclusion Criteria

- Pregnant women
- Booked and Unbooked Cases
- Diagnosed either before or during pregnancy
- Delivered at or > 28 weeks of gestation.

Exclusion Criteria

- I trimester termination of pregnancies
- Severe anemia

Detailed history regarding maternal age, parity, gestational age, nature of the underlying cardiac lesion, functional class using the criteria of New York Heart Association (NYHA) was recorded. A note was also made of history of Rheumatic fever in the childhood or adolescence, functional status before present pregnancy, prior cardiac intervention followed by through obstetrical and cardiac examination. Investigations: Haemoglobin, haematocrit, total and differential leukocyte count, blood glucose estimation, complete urine examination, urine for culture and sensitivity, obstetrical ultrasonography, and Doppler studies (wherever indicated) were noted. ECG and Echocardiography were done in every patient to know the type and severity of cardiac lesions.

All women were given antibiotic prophylaxis against infective endocarditis. Evaluation of Maternal and Perinatal Outcome: All these patients were evaluated for Obstetrical events like preterm delivery, precipitate labour, antepartum haemorrhage, mode of delivery, (spontaneous vaginal delivery / forceps / caesarean section), maternal morbidity, mortality and for fetal events like prematurity, IUGR, intrauterine foetal death, neonatal death, and perinatal mortality. All neonates less than 2.5 kg were taken as low birth weight and deliveries between 28 and 37 weeks were taken as preterm. Effects of pregnancy on heart disease like worsening of functional cardiac status, congestive heart failure, pulmonary oedema, arrhythmias, pulmonary hypertension, infective endocarditis, were also studied.^[5-7]

RESULTS

Table 1: Demographic Distribution

Age in years	No. of Cases	Percentage (%)
<20 Years	4	7.2727
20 – 25 Years	29	52.7272

26 - 30 Years	13	23.6363
31 – 35 Years	7	12.7272
36 – 40 Years	1	1.8181
Booking Status		
Booked	50	90.9090
Unbooked	5	9.0909
Parity		
Primi	23	41.8181
2nd		
3rd		
>=4		

Table 2: Type of Cardiac Disease

Type of Cardiac Disease	No. of Cases	Percentage (%)
CRHD	15	27.27
Congenital Heart Disease	15	27.27
Mild MS/ Sever MR	4	7.27
CPD	3	5.45
PDA	4	7.27
ASD	2	3.63
VSD	3	5.45
CHD	3	5.45
ACHD	1	1.81
TGA	3	5.45
TR	2	3.63

Table 3: Birth weight and perinatal outcome

Birth weight	No. Of Cases	Percentage (%)
1.5 - 1.9 Kgs	5	9.09
2 - 2.4 Kgs	10	18.18
2.5 - 2.9 Kgs	20	36.36
≥ 3 Kgs	19	34.54
Preterm 9 12%		
IUGR		
Alive		
NICU		
IUD		
Perinatal Mortality		

Table 4: Comparison of Intrapartum and Post-Partum Complications

Intrapartum Complications (If any)		Post-Partum Complications (If any)	
Nil	Yes	Nil	Yes
53	2	51	4

Table 5: NICU Admission

NICU Admission	
Yes	No
13	42

A total of 55 pregnant women with heart disease were studied and the outcome was analyzed. In this maximum members belongs to 20 to 25 years age group and least members belongs to 36 to 40 years. Total number of heart diseases delivered during the study period at our institute was 55 members. Incidence of heart disease in pregnancy varies from 0.5 -3%. In the present study, the incidence is 0.9%. In spite of low incidence, heart disease remains a leading cause of indirect maternal deaths during pregnancy accounting for 20% of all cases. In the present study chronic rheumatic heart disease contributes to 27.27%, followed by congenital heart disease 27.27%.

In the present study, age distribution varied from 20-40 yrs. majority of women (52.72%) are in the age group 20-25 years, followed by 23.63% in the age group of 26-30 years, 12.72% in the age group 31-35 years and 1.81% in the age group 36-40 years. 90.90% of cases are booked cases and 9.10% of cases are booked cases.

The ratio of CRHD: CHD is 2:1. The decrease in the ratio from 10:1 in the past to 2:1 shows that more number of women with congenital heart disease getting lesions surgically corrected and entering the childbearing age.

DISCUSSION

It is estimated that 0.3 -3.5 % of all pregnancies are complicated by heart disease and it accounts for 15 % of pregnancy related mortality. Teaching institutes in our country, being referral centres, may not reflect the actual prevalence of this medical disorder in pregnancy. It is an important cause of maternal mortality in India. Heart disease in pregnancy has reemerged as one of the leading causes of maternal mortality.

Table 6: Comparison of incidence of heart disease in different studies

S NO	STUDY	INCIDENCE
1	Kavitha Gayak et al (2015), ^[8]	0.39
2	Hema Gayathri et al (2015), ^[9]	1.82
3	Lubna Latif et al (2015), ^[10]	1.3
4	Lakshmi Prasanna Kosuru et al., (2016), ^[11]	0.5
5	Present study (2022)	0.9

Total number of heart diseases delivered during the study period at our institute was 55. Hence, the incidence of heart disease in this study is 0.9%. Incidence in the present study is comparable to the study of Lakshmi P Ket al.

Table 7: Ratio of cases of CRHD and CHD in different studies

S No	Study	% of CRHD	% of CHD	Ratio of CRHD:CHD
1	Mainak Sen et al (2014), ^[12]	70	30	2.3:1
2	Kavitha Gayak et al (2015), ^[8]	72	22	3.2:1
3	Jigar Kanubai et al (2016), ^[13]	72	16	4.5:1
4	Lakshmi Prasanna Kosuru et al., (2016), ^[11]	66.6	33.3	2:1
5	Present study (2022)	27.27	27.27	1:1

In the present study, the ratio of Rheumatic heart disease to congenital heart disease is 2:1. Although the incidence of cardiac abnormalities in pregnancy as a group has remained more or less unchanged, the relative contribution of the different causes of heart disease diagnosed

during pregnancy varies with the study population and study period. Present study shows rheumatic heart disease is two times more common than congenital heart disease. In this aspect, the present study coincides with the study of Pratibha et al and Asghar F et al. However, the incidence of rheumatic heart disease in developed countries has been greatly reduced by the widespread use of antibiotics effective against the streptococcal bacterium which causes rheumatic fever. Thus, present study indirectly indicates inadequate treatment of girls suffering from streptococcal infection in their childhood and adolescence. Cardiac arrhythmia and cardiomyopathy are seen frequently during pregnancy. It may be due to increased association of medical disorders like obesity, diabetes, hypertension, and stress during pregnancy. 84% of the cases in our study were in the age group 20-30 years. It coincides with the studies of Hiralal Konar et al and Lubna Latif et al. In the present study, 64% of cases were unbooked which coincides with the study of Naila Yasmeen et al. In the present study, there was near equal distribution of multigravida (60%) and prim gravida (40%) which correlates with the studies done by Hiralal Konar et al and Asghar F et al. With increasing gravidity, the rate of complications associated with heart disease increases due to indirect association with increasing age, duration of heart disease, progression of disease process. In the present study, distribution of parity coincides with the study of Hiralal Konar et al.

Table 8: Maternal and Perinatal outcome in CHD - Comparative studies

S No	Name and Year	No of cases	CCF	Preterm	IUGR	Alive	NICU	IUD	NND	MM
1	Khairy et al (2004), ^[14]	90	16%	20.80%	8.30%	95.8%		2.80%	1.40%	Nil
2	Pratibha et al (2010), ^[15]	112	0.91%	10%	38.18%	98.18%	40.91%	0.91%	0.91%	1.78%
3	Lakshmi Prasanna Kosuru et al., (2016), ^[11]	25	4%	12%	20%	96%	16%	4%	Nil	Nil
4	Present study (2022)	55	27.27%	10%	5%	11%	19%	3%	Nil	Nil

Incidence of preterm deliveries was 12% which is comparable with the studies of Khairy et al and Pratibha et al. Incidence of IUGR was 20% which is lower than the study of Prathibha et al. Incidence of IUGR is more in the cyanotic heart disease when compared to acyanotic heart disease. Lower incidence in this study is due to more number of cases of acyanotic heart disease and better NYHA class. Live birth rate was 96% which is close to the other studies. There was one Intra uterine fetal death in this group which was an unbooked referred in view of intrauterine fetal death due to severe oligohydramnios.

Table 9: Maternal and Perinatal outcome in Total STUDY GROUP - Comparative studies

S NO	Name and Year	No of cases	CCF	Preterm	IUGR	Still birth	IUD	NND	MM	PNM
1	Asghar et al 53754+5 (2005)	50	20%	14%	42.55%	Nil	Nil	2%	2%	2%
2	Hiralal Konar et al 53754+17 (2012)	281	7.40%	-	42.18%	1.77%	0.71%	2.13%	1.06%	4%
3	Lakshmi Prasanna	75	5%	8%	20%	Nil	2.7%	Nil	4%	4%

	Kosuru ET AL.,(2016)									
4	Present study (2022)	55	12%	9%	18%	1.12%	2.1%	2%	3%	2%

Perinatal mortality rate coincides with the study of HiralalKonar et al. In view of the high risk of low birthweight, preterm delivery, intra- uterine growth restriction IUD and still birth antenatal fetal surveillance becomes mandatory and should be offered to these women with rheumatic heart disease and with other cardiac disease.

CONCLUSION

In conclusion, preconceptional counselling, accurate riskassessment, regular antenatal checkups, prevention, earlyrecognition and aggressive treatment of complications during pregnancy are crucial in reducing the morbidity.Surgical correction of the cardiac lesion prior to pregnancy is associated with better pregnancy outcome.Functional cardiac status is the most important factor

affecting maternal and perinatal outcome. Termination/sterilization should be considered in women with advanced NYHA functional class, severe PAH. Amultidisciplinary approach involving skilledObstetricians, cardiologists, Anaesthetists, andNeonatologists in a tertiary care Centre with well-equippedfetomaternal units has utmost importance inimproving the fetomaternal outcome.

Acknowledgment

The author is thankful to Department of OBG & Cardiology for providing all the facilities to carry out this work.

REFERENCES

1. Hameed A, Karaalp IS, Tummala PP, Wani OR, Canetti M, Akhter MW, et al. The effect of valvular heart disease on maternal and fetal outcome of pregnancy. *J Am CollCardiol.* 2001;37:893-9.
2. Asghar F, Kokab H. Evaluation and outcome of pregnancy complicated by heart disease. *J Pak Med Assoc.* 2005;55:416-9.
3. Bhatla N, Lal S Behera G, Kriplani A, Mittal S. Agrawal N, et al. Cardiac disease in pregnancy. *Int J Gynaecol Obstet.* 2003;82(2):153-9.
4. Sawhney H, Aggarwal N, Suri V, Vasishta K, Sharma Y, Grover A. Maternal and perinatal outcome in rheumatic heart disease. *Int J Gynaecol Obstet.* 2003;80:9-14.
5. Salam S, Mushtaq S, Mohi-ud-Din, Gul I, Ali A. Maternal and fetal outcome in pregnancy with heartdisease in tertiary care hospital in India. *Int J ReprodContraceptObste Gynecol.* 2017; 6: 3947-51.
6. Sneha P, Sarojamma c, Nagrathamma R. Cardiac Disease complicating pregnancy: A Tertiary CareCentre Experience. *J Med Sci.* 2017; 3(2): 41-4.
7. Elliott C, Sliwa K, Anthony J. Perinatal Outcome in Pregnant Women with Heart Disease Attending aCombined Obstetric and Cardiology Clinic in a Resource Limited Country. *International Journal ofGynecology, Obstetrics and Neonatal Care.*2015; 2: 8-15.
8. KavithaGayaket al53754+. A Study on The Prevalenceof Cardiac Diseases Among The Pregnant Women. *IndoAmerican Journal of Pharm Research.* 2015; 5(02):810-5.
9. HemaGayathriArunachalam, Prabha Devi Kodey,GangadharaRaoKoneru, John Satish R and Mounica E.Prospective Study on Heart Disease ComplicatingPregnancy. *Int.J.Curr.Microbiol.App.Sci.* 2015; 4(8):215-222.

10. Latif L. Iqbal U. PREVALENCE OF CARDIACDISEASES; DURING PREGNANCY AND ITS FETOMATERNALOUTCOME. The Professional MedicalJournal. 2015; 22(11):1443-1448.
11. M Lakshmi PrasannaKosuru, K ArunaKumari. Clinical study of maternal and perinatal outcome in heart diseascomplicating pregnancy at tertiary referral center of Telangana State.MedPulse – International Journal of Gynaecology. November 2018;8(2): 46-54. <http://medpulse.in/Gynacology/index.php>
12. MainakSen, Parnamita Bhattacharyya,NilanjanaChowdhury. Pregnancy with Heart DiseaseFetomaternal Outcome. Journal of Evolution of Medicaland Dental Sciences. 2014; 3(5):1178-1183.
13. Dr JigarKanubhaiThakkar, Dr Pushpa A Yadav, DrRupa C Vyas. A Study of Pregnant Women with CardiacDisease.IOSR Journal of Dental and Medical Sciences(IOSR-JDMS). [cited Mar 2016]; 15(3)[III]:27-29.
14. Khairy P., Ouyang D.W., Fernandes S.M., et al53754+Pregnancy outcomes in women with congenital heartdisease. Circulation 2006; 113:517-524.
15. Devabhaktuni P, Dev'neni K, Vemuri UR, Naman GV.Pregnancy outcome in chronic rheumatic heart disease. JobstetGynecol India 2009; 59(1):41-46.