

Maternal and Perinatal Outcomes of Pregnancies Complicated by Cardiac Disease: An Institutional Based Study

Sunita Gulati¹, Anuradha^{1*}

¹Associate Professor, Department of Obstetrics & Gynaecology, Rama Medical College Hospital and Research Centre, Hapur, Uttar Pradesh, India.

ABSTRACT

Background: Cardiac disorders complicate approximately 1-3% of pregnancies. The present study was conducted to assess maternal and perinatal outcomes of pregnancies complicated by cardiac disease.

Materials and Methods: This prospective cohort study was carried out among 50 cases of cardiac disease in pregnancy in Department of Obstetrics & Gynaecology, Rama Medical College Hospital and Research Centre, Hapur, Uttar Pradesh (India) over a period of 1 year. Data was collected from females. Adverse Maternal and perinatal outcomes were recorded. Collected data was analyzed. P-value < 0.05 was considered as significant.

Results: In the present study 50 pregnant women complicated by heart disease were studied over a period of 1 year. Of the total cases, 15(30%) were multipara, remaining were primigravida. Maximum number of patients belonged to NYHA functional classes I and II (90%), and only 10% from classes III and IV. Among the heart diseases, rheumatic heart disease constitutes 54%, congenital heart disease 34%, miscellaneous accounts for about 12%. Among rheumatic heart diseases, mitral regurgitation was most common. Among women with congenital heart disease, atrial septal defect was the most common lesion. Cardiac complications were observed in 15 patients (30), 11 patients (22%) had pulmonary edema, 4 patients (8%) had atrial fibrillation and not a single case

complicated by infective endocarditis which can be due to strict policy for bacterial endocarditis prophylaxis. There were 3 maternal deaths (6%), 6% Neonatal deaths occurred and in 4% newborns congenital heart disease were present.

Conclusion: The present study concluded that rheumatic heart disease was more common in pregnant females than congenital. Cardiac complications were observed in 30% and 6% maternal deaths. 6% Neonatal deaths occurred and in 4% newborns congenital heart disease were present.


Keywords: Heart Disease, Rheumatic Heart Disease, Bacterial Endocarditis Prophylaxis.

*Correspondence to:

Dr. Anuradha,
Associate Professor,
Department of Obstetrics & Gynaecology,
Rama Medical College Hospital and Research Centre,
Hapur, Uttar Pradesh, India.

Article History:

Received: 13-04-2020, Revised: 04-05-2020, Accepted: 28-05-2020

Access this article online	
Website: www.ijmrp.com	Quick Response code 
DOI: 10.21276/ijmrp.2020.6.3.045	

INTRODUCTION

Heart disease is considered as one of the important concerns resulting in maternal mortality and morbidity in the antenatal and postnatal periods.¹ There are two groups of cardiac disease in women of childbearing age: Congenital and acquired heart disease. The acquired heart disease group comprises rheumatic heart disease (RHD), cardiomyopathies, and ischemic heart disease. Of these, RHD is known as the most common type in developing countries, while cardiomyopathies and congenital heart disease (CHD) are the main types in developed countries.² Prevalence of heart disease in pregnancy is found to vary between 0.3-3.5%.³ Heart diseases are now the leading cause of indirect maternal deaths accounting for 20.5% of all cases.^{4,5} Rheumatic mitral stenosis is the most common valvular abnormality encountered in pregnant women and may be associated with pulmonary edema, and atrial arrhythmias during

pregnancy or soon after delivery. Mortality among pregnant women with minimal symptoms is less than 1%.^{6,7} Patients with severe symptoms, class III or IV according to New York heart association classification (NYHA) or tight mitral stenosis, carry a significant risk (5— 15%) of maternal mortality.⁸ In India, heart disease is diagnosed mostly in pregnancy for the first time, when increased demands on the heart trigger symptoms and unmask cardiac disease.^{9,10} Management of pregnant women with pre-existing cardiac problems should be undertaken by multidisciplinary teams in tertiary centers. In women with pre-existing cardiac disease wishing to proceed to term, cardiac status must be optimized preoperatively and preferably a planned elective delivery should be scheduled.¹¹ The present study was conducted to assess maternal and perinatal outcomes of pregnancies complicated by cardiac disease.

MATERIALS AND METHODS

This prospective cohort study was carried out among 50 cases of cardiac disease in pregnancy in Department of Obstetrics & Gynaecology, Rama Medical College Hospital and Research Centre, Hapur, Uttar Pradesh (India) over a period of 1 year. Before the commencement of the study ethical approval was taken from the ethical committee of the institute and informed consent was taken from the patient/guardian. All pregnant women with congenital or acquired heart disease or those women diagnosed with peripartum cardiomyopathy were included in the study. Women referred for termination of pregnancy were excluded for the study. Data was collected from females which contains demographic characteristics, clinical history, cardiac lesions, New York Heart Association (NYHA) functional class. Functional grading was made according to the criteria of NYHA classification.¹⁴ A thorough clinical examination was done to find out the type of cardiac lesion and any signs of heart failure. All relevant investigations were done. The routine obstetric examination was done. The patients were advised regular antenatal checkups along with cardiologist consultation. Women were advised rest, iron and folic acid supplementation, explained

importance of avoidance of infections, and an early visit to the clinic if there is any deterioration of health condition. Management was planned as a joint approach by a cardiologist and obstetrician according to the condition of the patient, NYHA functional status, and type of cardiac lesion, cardiovascular stability, and duration of pregnancy and viability of the foetus. Women with NYHA classes I and II were admitted to the hospital at 36 weeks. Vaginal delivery was preferred. Induction of labour was considered for the most stringent obstetric indications. Cesarean section was done only for clear obstetric indications. Intramuscular syntocin was given following the completion of the second stage except in patients with heart failure. After delivery, the patient was assessed for well-being and cardiac and obstetric complications. All patients were given infective endocarditis prophylaxis for seven days. All patients were hospitalized for five days postnatally for antibiotic coverage. Newborns of mothers with congenital heart disease were examined for the inheritance of the disease. Adverse Maternal and perinatal outcomes were recorded. Collected data were entered into a Microsoft Excel spreadsheet and were analyzed. P-value < 0.05 was considered as significant.

Table 1: Distribution of heart disease.

Heart disease	N(%)
Rheumatic	27(54%)
Mitral regurgitation	13
Mitral stenosis	6
Tricuspid regurgitation	3
MS+MR	2
MS+MR+TR	3
Congenital	17(34%)
Atrial septal defect	7
Post ASD Closure	3
Ventricular septal defect	3
POST VSD Closure	3
Patent ductus arteriosus	1
Miscellaneous	6(12%)
Peripartum cardiomyopathy	4
Sinus Arrhythmia	2

Table 2: Maternal outcomes

Type of complication	N(%)
Non-cardiac	32(64%)
Anemia	10(20%)
PIH	6(12%)
Abruptio placentae	2(4%)
PPH	4(8%)
Hypothyroid	6(12%)
GDM	3(6%)
Wound infection	1(2%)
Cardiac	15(30%)
Pulmonary edema	11(22%)
Atrial fibrillation	4(8%)
Bacterial endocarditis	0(0%)
Maternal death	3(6%)

Table 3: Perinatal outcome

Gestational age (Mean ± SD)	34.43±4.32 weeks
Spontaneous labor	46(92%)
Induced labor	4(8%)
Normal delivery	32(64%)
Instrumental delivery	8(16%)
Caesarean section	11(22%)
Birth weight (kg) Mean	2.64±0.46kg
Neonatal death	3(6%)
Congenital heart disease in newborn	2(4%)

RESULTS

In the present study 50 pregnant women complicated by heart disease were studied over a period of 1 year. Of the total cases, 15(30%) were multipara, remaining were primigravida. Maximum number of patients belonged to NYHA functional classes I and II (90%), and only 10% from classes III and IV. Among the heart diseases, rheumatic heart disease constitutes 54%, congenital heart disease 34%, miscellaneous accounts for about 12%. Among rheumatic heart diseases, mitral regurgitation was most common. Among women with congenital heart disease, atrial septal defect was the most common lesion. Cardiac complications were observed in 15 patients (30), 11 patients (22%) had pulmonary edema, 4 patients (8%) had atrial fibrillation and not a single case complicated by infective endocarditis which can be due to strict policy for bacterial endocarditis prophylaxis. There were 3 maternal deaths (6%).6% Neonatal deaths occurred and in 4% newborns congenital heart disease were present.

DISCUSSION

Pregnancy contributes to significant hemodynamic changes i.e. 30-50% increase in cardiac output and blood volume which can lead to cardiac decompensation in cardiac patients. The proportion of women of reproductive age group with congenital heart defects, surgically treated or otherwise has increased substantially in recent decades due to improved surgical and cardiac care.¹³

In the present study 50 pregnant women complicated by heart disease were studied over a period of 1 year. Of the total cases, 15(30%) were multipara, remaining were primigravida. Maximum number of patients belonged to NYHA functional classes I and II (90%), and only 10% from classes III and IV. Among the heart diseases, rheumatic heart disease constitutes 54%, congenital heart disease 34%, miscellaneous accounts for about 12%. Among rheumatic heart diseases, mitral regurgitation was most common. Among women with congenital heart disease, atrial septal defect was the most common lesion. Cardiac complications were observed in 15 patients (30), 11 patients (22%) had pulmonary edema, 4 patients (8%) had atrial fibrillation and not a single case complicated by infective endocarditis which can be due to strict policy for bacterial endocarditis prophylaxis. There were 3 maternal deaths (6%).6% Neonatal deaths occurred and in 4% newborns congenital heart disease were present.

RHD was much more common than CHD, which was consistent with previous studies.¹⁴⁻¹⁶

Chaudhari P et al found that out of 37 patients with cardiac disease during pregnancy 32.4% were diagnosed during current pregnancy. Rheumatic heart diseases were seen in 54.05 %

patients and congenital heart disease seen in 35.1%. out of these 81.1% patients belonged to NYHA class I and II and 18.9% patients in class III & IV. Majority of patients (78.3%) had vaginal delivery. 5.4% maternal mortality and 2.7% of neonatal mortality rate was observed.¹⁷

Koregol M et al evaluated the maternal and fetal outcomes of pregnancies, complicated by cardiac disease. Rheumatic heart disease with isolated mitral stenosis (n=49) was the predominant cardiac problem. 9 Patients (8.18%) had undergone surgical correction prior to pregnancy. Cardiac complications were noted in 20 (18.18%) patients, out of which 12 had pulmonary oedema. Maternal mortality was noted in 4 patients (3.6%), 3 of which were due to pulmonary oedema. The incidence of small for gestational age was noted in 48 (46.3%) patients, still birth was noted in seven (6.8%) babies and neonatal death was noted in three patients (2.9%).¹⁸

CONCLUSION

The present study concluded that rheumatic heart disease were more common in pregnant females than congenital. Cardiac complications were observed in 30% and 6% maternal deaths. 6% Neonatal deaths occurred and in 4% newborns congenital heart disease were present.

REFERENCES

1. Koutrolou-Sotiropoulou, P.; Parikh, P.B.; Miller, C.; Lima, F.V.; Butler, J.; Stergiopoulos, K. Impact of heart disease on maternal and fetal outcomes in pregnant women. *Am. J. Cardiol.* 2015, 116, 474–80.
2. Mishra, R. *Ian Donald's Practical Obstetric Problems*; BI Publications: New Delhi, India, 2010.
3. Sugrue D, Blake S, MacDonald D, Pregnancy complicated by maternal heart disease at the National Maternity Hospital, Dublin, Ireland, 1969 to 1978 *American Journal of Obstetrics and Gynecology* 1981; 139(1):01-06.10.1016/0002-9378(81)90400-2.
4. Gary Cunningham F, Leveno KJ, Bloom SL, Spong CY, Dashe JS, Hoffman BL, *Cardiovascular disorders*. In (ed) F. Gary Cunningham Williams *Obstetrics* 2014. 24th ed McGraw Hill: 973-1000.
5. Burlingame J, Horiuchi B, Ohana P, Onaka A, Sauvage LM, The contribution of heart disease to pregnancy-related mortality according to the pregnancy mortality surveillance system *Obstetrical & Gynecological Survey* 2012 67(7): 393-95. 10.1097/01.ogx.0000418568.37021.b9 .
6. Clark S. Cardiac disease in pregnancy. *Crit Care Clin* 1991; 7:777 – 97.

7. Barbosa P, Lopes A, Feotpsa G, Almeida RV, Silva RM, Brito JC, et al. Prognostic factors of rheumatic mitral stenosis during pregnancy and puerperium. *Arq Bras Cardiol* 2000; 75: 220 – 4.
8. Sawhney H, Aggarwal N, Suri V, Vasishtha K, Sharma Y, Grover A. Maternal and perinatal outcome in rheumatic heart disease. *Int J Gynaecol Obstet* 2003;80(1):9 – 14.
9. Prasad AK, Ventura HO. Valvular heart disease and pregnancy. A high index of suspicion is important to reduce risks. *Postgrad Med J*. 2001;110:69–72. doi:10.3810/pgm.2001.08.996.
10. Asghar F, Kokab H. Evaluation and outcome of pregnancy complicated by heart disease. *J Pak Med Assoc*. 2005;55(10):416–9.
11. P. Ray, G. J. Murphy and L. E. Shutt. Recognition and management of maternal cardiac disease in pregnancy. *Br. J. Anaesth*. 2004; 93: 428-39.
12. The Criteria Committee of the New York Heart Association. In: *Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Great Vessels*. Boston, Mass: Little, Brown & Co; 1994. p. 253–6.
13. Ahmed N, Kausar H, Lubna Ali R. Fetomaternal outcome of pregnancy with Mitral stenosis. *Pak J Med Sci*. 2015;31(3):643.
14. Pillutla, P.; Nguyen, T.; Markovic, D.; Canobbio, M.; Koos, B.J.; Aboulhosn, J.A. Cardiovascular and neonatal outcomes in pregnant women with high-risk congenital heart disease. *Am. J. Cardiol*. 2016, 117, 1672–77.
15. Joshi, G.; Joshi, S.; Jha, S.; Singh, Y.; Joshi, A. Maternal heart disease and pregnancy outcome: Findings from a retrospective cohort in a tertiary care government hospital in Haldwani, Nainital. *Niger. J. Cardiol*. 2015, 12, 120–3.
16. Abbasi, S.; Siddiqua, S.F.; Rijvi, S.; Akhtar, S.; Haque, B.; Jesmin, S. Study of Maternal and Fetal Outcome in Pregnancy with Heart Disease. *Anwer Khan Mod. Med Coll. J*. 2017;8: 112–6.
17. Chaudhari P, Gupta V, Kumari N, Tandon A, Gupta N. Maternal and perinatal outcomes of pregnancies complicated by cardiac disease at tertiary level hospital of Uttarakhand. *Int J Reprod Contracept Obstet Gynecol* 2017;6:3338-42.
18. Koregol M, Mahale N, Nayak R, Bhandary A. Maternal and perinatal outcomes of pregnancies complicated by cardiac disease. *J Turkish-German Gynecol Assoc*. 2009 Mar 1;10:30-4.

Source of Support: Nil.

Conflict of Interest: None Declared.

Copyright: © the author(s) and publisher. IJMRP is an official publication of Ibn Sina Academy of Medieval Medicine & Sciences, registered in 2001 under Indian Trusts Act, 1882.

This is an open access article distributed under the terms of the Creative Commons Attribution Non-commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Cite this article as: Sunita Gulati, Anuradha. Maternal and Perinatal Outcomes of Pregnancies Complicated by Cardiac Disease: An Institutional Based Study. *Int J Med Res Prof*. 2020 May; 6(3): 206-09. DOI:10.21276/ijmrp.2020.6.3.045