



CARDIAC DISEASES IN PREGNANCY: FETO-MATERNAL OUTCOMES

Dr. Shery Angel Rajakumar	Associate professor, Department of Obstetrics and Gynaecology, Chettinad Hospital & Research Institute, Kelambakkam, Chennai-603103, Tamil Nadu, India.
Dr. Saloni	Assistant professor, Department of Obstetrics and Gynaecology, Chettinad Hospital & Research Institute, Kelambakkam, Chennai-603103, Tamil Nadu, India.
Dr. Sindhura Myneni*	Assistant professor, Department of Obstetrics and Gynaecology, Panimalar Medical College Hospital & Research Institute, Varadharajapuram, Poonamallee, Chennai-600123, Tamil Nadu, India. *Corresponding Author

ABSTRACT **Background:** Cardiac diseases in pregnancy has a significant impact on fetal and maternal health, which complicates 1-4% of all pregnancies and accounts for upto 15% of maternal deaths. The objective of our present study was to analyse maternal and neonatal outcomes in pregnancy with cardiac diseases. **Methods:** Retrospective study done for a period of 3 years. All pregnant women with cardiac diseases were included. The data regarding maternal and neonatal outcomes were collected and analysed. **Results:** 24 cases with cardiac diseases in pregnancy were noted. Rheumatic heart disease was the common cardiac disease and mitral stenosis was the commonest lesion noted. Mean age of patients was 24.1 years. 58.34% were primigravida. 79.16% had term delivery. 50% had vaginal delivery. 9 babies required NICU care. One perinatal mortality noted. No maternal mortality was noted. **Conclusion:** Cardiac diseases in pregnancy constitute high risk pregnancy with significant maternal and neonatal complications. Early diagnosis, multidisciplinary approach involving cardiologist, obstetrician and neonatologist improves fetomaternal outcome.

KEYWORDS : Cardiac diseases, Rheumatic heart disease, feto maternal outcome.

INTRODUCTION:

Cardiac disease complicates 1-4% of all pregnancies and accounts for upto 15% of maternal deaths.^{1,2,3} Even though maternal mortality due to leading causes such as hemorrhage and infection are declining, mortality due to maternal cardiac disease is increasing.^{4,5} Cardiac problems may start during pregnancy without any history of heart issues. Certain heart diseases like mitral valve regurgitation and or prolapse, Aortic valve regurgitation, atrial and ventricular septal defects carry a very low risk to mother and to the fetus.

Classic symptoms of cardiac diseases like breathlessness, pedal edema and murmurs mimicks the normal physiological changes in pregnancy posing a diagnostic difficulty.^{6,7} Increase in cardiac output by 30-50% during pregnancy and a further increase during labour and delivery imposes a burden on diseased heart which leads to complications and death. Early diagnosis, proper follow up and counselling helps in reducing mortality and morbidity rates which requires a collaboration between obstetrician and cardiologists.

In developing countries like India, Rheumatic Heart Disease(RHD) is the most cardiac disease. Worldwide, Mitral Stenosis(MS) is the most common valvular defect responsible for maternal deaths with cardiac disease. Hence, we aim to analyse maternal and neonatal outcomes in pregnancy with cardiac diseases.

METHODS:

This was a retrospective study conducted the department of Obstetrics and Gynecology at Chettinad Hospital & Research Institute, which is a tertiary care teaching hospital. All the women with cardiac diseases who were admitted during of period of 3 years from January 2016 to December 2019 were included in the present study. The data regarding age, parity, gestational age, type of cardiac lesion, treatment history, maternal complications, mode of delivery & indication of caesarean section, neonatal outcome & admission to NICU were noted. All the details were entered in micro soft excel spread sheet and analysed by using SPSS software.

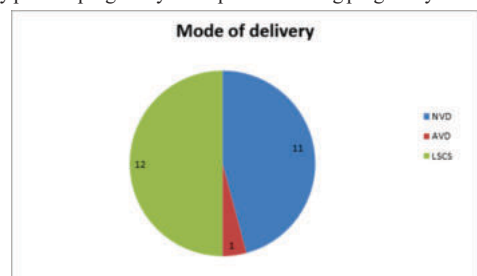
RESULTS:

In our present study, total of 24 pregnant women with heart diseases were admitted and outcomes were analysed. Mean age of the patients was 24.1 years(ranging from 19-36 years). Age group belonging to 21-25 years is the most commonly affected(54.16%), followed by 26-30 years age group (20.84%). 58.34% were primigravida, while 33.33% were second gravida, remaining 8.33% cases were gravida 3 and more. Maximum number of patients had term delivery (79.16%).

Table: 1 Showing demographic characteristics

Age in years	No. of patients
18-20	3(12.50%)
21-25	13(54.16%)
26-30	5(20.84%)
>30	3(12.50%)
Gravida	No. of patients
Primi	14(58.34%)
G2	8(33.33%)
G3 and >	2(8.33%)
Gestational age	No. of patients
Term	19 (79.16%)
Preterm	5 (20.84%)

In our study, 50% had vaginal delivery (NVD & AVD) and caesarean section was done in 50% patients. Most common indication of caesarean section is previous LSCS. Rheumatic heart disease was the most common cardiac disease and mitral stenosis was the commonest lesion noted in our study. Out of 24 cases, 6 patients underwent cardiac surgery prior to pregnancy and 3 patients during pregnancy.

**Figure: 1 Showing Mode of delivery****Table :2 Showing Neonatal outcomes**

Low birth weight	3
IUGR	1
Prematurity	5
Mortality	1
Total NICU admissions	9

In our present study, 9 babies required NICU care, 5 babies were premature, 1 baby is IUGR and 3 babies had low birth weight. One perinatal mortality was noted. In our current study we had no maternal mortality.

DISCUSSION:

In our present study, total of 24 pregnant women with heart diseases were admitted and outcomes were analysed. Mean age of the patients was 24.1 years (ranging from 19-36 years). Age group belonging to 21-25 years is the most commonly affected (54.16%), followed by 26-30 years age group (20.84%) which is in comparison with previous studies.^{8,9}

Rheumatic heart disease was the most common cardiac disease and mitral stenosis was the commonest lesion noted in our study, which is similar to other studies.^{10,11,12,13} In our study, 58.34% were primigravida, while 33.33% were second gravida, remaining 8.33% cases were gravida 3 and more which is similar to various studies.^{8,9,14} In our current study, maximum number of patients had term delivery (79.16%) which is similar to Chaudhary K et al study.⁸ 50% had vaginal delivery and caesarean section was done in 50% patients. Previous studies showed majority of the women delivered vaginally.^{8,10} Most common indication of caesarean section is previous LSCS, which is in consistent with various studies.^{8,15} In our present study, 9 babies required NICU care, 5 babies were premature, 1 baby is IUGR and 3 babies had low birth weight. One perinatal mortality was noted.

Out of 24 cases, 6 patients underwent cardiac surgery prior to pregnancy and 3 patients during pregnancy. This is in consistent with few studies. Previous studies showed fetomaternal complications were more in non operated patients when compared to operated patients.^{7,8} Various studies showed fetal and neonatal complications were more in group of patients who were taking cardiac medications.^{7,8} This might be due to hemodynamic compromise secondary to valvular stenosis, maternal arrhythmias and cardio active drugs like diuretics, digitalis and beta blockers which have been associated with impairment of uterine blood flow. Cardiac failure is a major complication during pregnancy and often associated with maternal mortality. Various studies reported maternal mortality, due to CHF.^{8,16} In our current study we had no maternal mortality.

Contraceptive counseling and family planning and follow up during subsequent pregnancies is necessary. The innovative investigations like 2D-Echo and TEE are becoming easily available for the patients and also are better intensive care unit services available so that management of patients with heart diseases with pregnancy should not be a big problem in the future.

CONCLUSION:

Cardiac diseases in pregnancy constitute high risk pregnancy and hence therefore to be counseled and treated as early as possible. Early diagnosis, multidisciplinary approach, cardiac ICU, well equipped NICU constitutes to decreased maternal and neonatal morbidity and mortality. Detailed fetal Echo at 22-24 weeks is recommended to diagnose congenital cardiac defects during antenatal period. Creating awareness about heart diseases during pregnancy and the importance of regular antenatal check-ups, pre-conceptional counseling and surgical correction of certain conditions improves maternal as well as fetal outcome.

Declaration:

Funding: None.

Conflict of interest: None declared.

Ethical clearance: The study was approved by institutional ethical committee.

REFERENCES:

1. Regitz-Zagrosek V, Roos-Hesselink JW, Bauersachs J, Blomstrom-Lundqvist C, Cifkova R, De Bonis M, Iung B, Johnson MR, Kintscher U, Kranke P, Lang IM. 2018 ESC guidelines for the management of cardiovascular diseases during pregnancy. *Kardiologia Polska (Polish Heart Journal)*. 2019;77(3):245-326.
2. Ramlakhan KP, Johnson MR, Roos-Hesselink JW. Pregnancy and cardiovascular disease. *Nature Reviews Cardiology*. 2020 Nov;17(11):718-31.
3. Shah PT, Bhagat MA, Patel RV, Yadav SM. Cardiac diseases in pregnancy and its fetomaternal outcome. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2018 Nov 1;7(11):4747-52.
4. Alkema L, Chou D, Hogan D, Zhang S, Moller AB, Gemmill A, Fat DM, Boerma T, Temmerman M, Mathers C, Say L. Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group. *The Lancet*. 2016 Jan 30;387(10017):462-74.
5. Khan KS, Wojdyla D, Say L, Gülmezoglu AM, Van Look PF. WHO analysis of causes of maternal death: a systematic review. *The Lancet*. 2006 Apr 1;367(9516):1066-74.
6. Davies GA, Herbert WN. Assessment and management of cardiac disease in pregnancy. *Journal of Obstetrics and Gynaecology Canada*. 2007 Apr 1;29(4):331-6.
7. Bhatla N, Lal S, Behera G, Kriplani A, Mittal S, Agarwal N, Talwar KK. Cardiac disease in pregnancy. *International Journal of Gynecology & Obstetrics*. 2003 Aug;82(2):153-9.
8. Chaudhary K, Sen S. Fetomaternal outcomes in pregnancy with different cardiac disease at a tertiary care center in Udaipur. *International Journal of Reproduction,*

Contraception, Obstetrics and Gynecology. 2020 Oct 1;9(10):3983-9.

9. Sayeeda S, Wahid F, Begum F, Zaman MM. A two years study on pregnant women with cardiac disease in a tertiary care centre. *Bangladesh Journal of Obstetrics & Gynaecology*. 2008;23(1):8-14.
10. Avila WS, Rossi EG, Ramires JA, Grinberg M, Bortolotto MR, Zugaib M, da Luz PL. Pregnancy in patients with heart disease: experience with 1,000 cases. *Clinical Cardiology*. 2003 Mar;26(3):135-42.
11. Doshi HU, Oza HV, Tekani H, Modi K. *J Indian Med Assoc*. 2010;108:278-80.
12. Bagde ND, Bagde MN, Shivkumar PV, Tayade S. Clinical profile and obstetric outcome in pregnancies complicated by heart disease: a five year Indian rural experience. *Int J Reprod Contracept Obstet Gynecol*. 2013;2:52-7.
13. Abdel Haby ES, Shamy M, El-Fifai AA. Maternal and perinatal outcome of pregnancies complicated by cardiac disease. *Int J Obstet gynecol*. 2005;90:21-5.
14. Trevino ER, Delgado GT, Navarro JJ. Perinatal outcomes in pregnant women with heart disease: Hospital General Leon experience. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2019 Jan 1;8(1):54-9.
15. Sawhney H, Aggarwal N, Suri V, Vasishtha K, Sharma Y, Grover A. Maternal and perinatal outcome in rheumatic heart disease. *International Journal of Gynecology & Obstetrics*. 2003 Jan;80(1):9-14.
16. Pandey K, Verma K, Gupta S, Jahan U, Kirti N, Gupta P. Study of pregnancy outcome in women with cardiac disease: a retrospective analysis. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2016 Oct 1;5(10):3537-42.