

**FETOMATERNAL OUTCOME IN CARDIAC DISEASE WITH PREGNANCY**

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ABSTRACT

BACKGROUND: Heart disease is most important cause of maternal mortality. Problems may arise due to hemodynamic burden and the hypercoagulable state of pregnancy. Identifying women at high risk is an important aspect of care for women with Heart disease.

MATERIAL AND METHOD: This prospective study is an analysis of maternal and fetal outcome in cases of cardiac disease in pregnancy was carried out in department of obstetrics and gynecology in civil hospital, Ahmedabad.

RESULTS: The prevalence of Heart Disease in present study is 0.67% which is more common in child bearing age. RHD is still a major group of heart disease in pregnancy among which mitral valve disease is the commonest. With Increase in severity of NYHA grade there is increase of chances of maternal morbidity and mortality. Preterm labor is common in patients with cardiac diseases.

CONCLUSION: Educating the community about the cardiac disease and its complications, need for early detection of cardiac lesion, close monitoring during antenatal period, intrapartum period and postpartum care play a vital role in achieving good fetomaternal outcome. Use of prophylactic antibiotics, anti failure treatment during labor may bring down the incidence of infective endocarditis and cardiac failure during antenatal as well as puerperal period.

KEYWORDS :**INTRODUCTION**

Heart disease complicates more than 1 percent of all pregnancies and now is leading cause of indirect maternal deaths-accounting of 20 percent of all cases.

Pregnancy comes as a temporary complication in the disease process of a patient with a cardiac lesion. Prevalence of heart disease in pregnancy varies from 0.3%-3.5%.

It is the fourth common cause of maternal mortality and one of the most important non obstetrical causes of maternal death.

Previously most women with diagnosed heart disease were advised to avoid pregnancy and labor and termination was advised. But in modern obstetrical practice, pregnancy in a patient with a heart disease is no longer an unacceptable hazard. Joint management between the obstetrician and the cardiologist has improved the outcome of pregnancy and reduced maternal risks.

The most common clinical features of cardiac lesions like breathlessness, pedal oedema, murmurs which mimic normal physiological changes in pregnancy posing a diagnostic difficulty for obstetricians.

In first trimester nearly 30% increase in stroke volume due to ventricular remodeling and decrease in after load due to fall in systemic vascular resistance. Later on increase in cardiac output is sustained by increase in heart rate of about 10-20 beats per minute. This increase in heart rate and cardiac output has deleterious effect on stenotic lesions.

During labor, cardiac output increases by 45% above the pre labor level, with up to 500 ml of blood being pumped into circulation with uterine contraction.

After delivery of the baby, caval compression is relieved and after placenta is delivered, another auto transfusion occurs from the placental sinusoids into maternal circulation, both increases the cardiac output and stroke volume 80% above baseline.

In patient of cardiac disease, there is more chances of abortion, preterm delivery, fetal growth restriction and fetal death.

The time to learn about identifying high risk factor pregnancy, different mode of deliveries, in such patients is prior to pregnancy. The management includes intensive care throughout pregnancy and also during labor and postpartum. The earliest signs of complication need to be watched for so, Longer hospitalization period is always recommended in antenatal and even postnatal period. Vigilance with combined efforts from the obstetrician, a physician and a cardiologist and is mandatory for successful course and outcome of pregnancies complicated by heart diseases.

Though heart disease is often a worrying problem, the study shows that outcome of pregnancy is generally satisfactory and majority of the patients with proper management achieve normal vaginal delivery after spontaneous onset of labor.

AIMS AND OBJECTIVE:

- To assess maternal and fetal outcome and prognosis in cases of cardiac disease in pregnancy.
- To assess effect of pregnancy on cardiac disease and effect of cardiac disease on pregnancy.

MATERIAL AND METHOD

In this study, patient's detailed demographic information, diagnosis, course in the hospital, management and analysis of maternal and fetal outcome in 100 cases of cardiac disease in pregnancy was carried out in the department of Obstetrics and Gynecology in B.J. Medical College civil Hospital, Ahmedabad at a tertiary care center from 01/08/2018 to 31/07/2019.

INCLUSION CRITERIA:

- Patient with known case of RHD or diagnosed during present pregnancy.
- Patient with congenital heart disease.
- Patient with ischemic heart disease.
- Patient with prosthetic heart valve and surgically corrected heart disease.
- Patient with any cardiac disease.

EXCLUSION CRITERIA:

- Patient who is not willing to participate in study.
- All conditions mimicking heart disease were excluded.

RESULTS AND DISCUSSION

In our study ,out of total 14,708 deliveries during period 01/08/2018 to 31/07/2019 , there were 100 cases of pregnancy with cardiac disease and they were studied in terms of maternal and fetal outcomes. Total 14708 patients were registered as indoor patients at our setup during the study period. Prevalence of cardiac disease during the study was 0.67%.

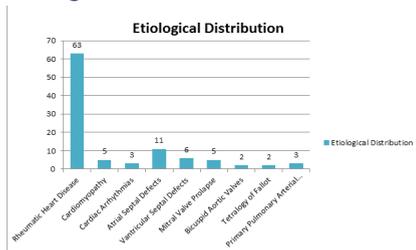
Table 1: Maternal age and Heart disease study comparison of present study with other author study

Age group	Present study (%)	Pandey k. et al study(2016) ²⁵
<20= Year	7%	28%
21-25Year	49%	36%
26-30 Year	24%	28%
31-40 year	20%	8%

In Present Study Out of 100 patients, 7 patients were from 18-20-year age group, 49 patients were from 21-25 years of age group, 24 patients were 26-30 years' age group, while 20 patients were 31-40 years' age group. This suggests cardiac disease during pregnancy was more common in child bearing age group, because of Majority of patient with cardiac disease was first time diagnosed during antenatal, intrapartum or postpartum period.

In the present study, total of 100 patients 96 patient delivered, while 2 patients underwent termination of pregnancy while one patient had spontaneous abortion and one patient had 2nd trimester IUD.

Figure:2 Etiological Distribution

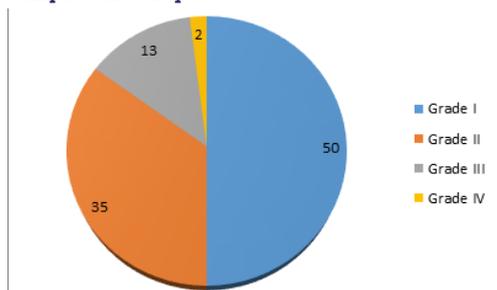


In the present study out of 100 cases, 63 patients were found to have Rheumatic Heart Disease. Among all presentations of Rheumatic Heart Disease, Mitral stenosis is the predominant lesion.

Cardiomyopathies are being increasingly recognized, with three main Types-Dilated, restrictive and hypertrophic cardiomyopathy.

With advances in surgical techniques, the prognosis of congenital heart disease has improved and majority have survived in adulthood. In the present study, the commonest lesion in congenital heart disease found during pregnancy was operated Atrial septal defect in 11 patients. Pregnancy is well tolerated unless pulmonary hypertension has developed, but this is uncommon.

Figure 3 : Severity of heart disease according to NYHA Grade in present study



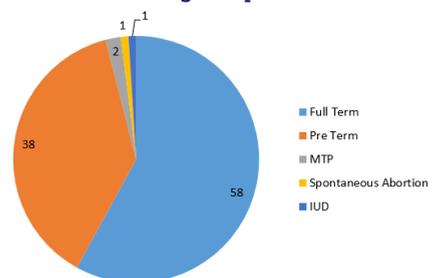
Most of the patients were in Grade I and II of NYHA classification. With proper care and management normal labor and delivery were achieved in most of these patients. The patients of Grade III and IV were immediately hospitalized and need intensive care because as the grade increases, the maternal and fetal prognosis worsens. Grade III and IV patients had more chances of development of cardiac complications like congestive cardiac failure, pulmonary edema and many more. Poor functional class III-IV in addition to severity of the cardiac lesion is a significant risk factor for both mother and child. Out of 8 cases of Grade III and IV, 6 cases developed CCF. Thus these patients of Grade III and IV patients present a challenge in obstetric management. Hence multi disciplinary approach is needed for such patients.

Table 4: Complications Of Heart Disease

Complications	Other
Congestive Cardiac Failure	8
Pneumonia	2
Pleural Effusion	6
Pulmonary Edema	6
Thromboembolism	1
Maternal Mortality	4
Post-Partum Hemorrhage	4
Cardiomyopathies	1

Total 32 patients developed complications. Out of 100 cases 8 patient developed CCF, 6 patients were developed pleural effusion and 6 patient developed pulmonary edema. None of the patient developed acute rheumatic fever probably due to improved and regular prophylaxis by Inj. Benzathine Penicillin 1.2 MU IM every 21 days which is very effective drug in preventing attacks of rheumatic fever. Most of the patients who developed complications belonged to NYHA grade 3 to 4 from the very beginning and thus this shows that as the functional grade increases the incidence of cardiac de compensation also increases. In developing countries like India, cardiac disease complicates 2% of pregnancies and contribute to 1/5 of all maternal death. Those patient with a treated cardiac valvular lesion with prosthetic valve pose a special problem at time of delivery. These patients were at increased risk to develop complications like thrombosis, endocarditis. In such cases anticoagulant drugs are needed. As soon as pregnancy confirm switch from warfarin to LMWH to prevent teratogenicity upto 12 weeks. Again covert to warfarin from 12 week to 36 week (maintain INR between 2.5 to 3.5)and changed to LMWH after 36 weeks till 7 days postpartum. Stop all anticoagulant before and after delivery for 24 hrs to prevent PPH in mother and intracranial hemorrhage in baby. In present study one patient develop thrombosis.

Figure 5 : Outcome Of Pregnancy



According to the indication and condition of patients, the mode of deliveries was planned. Out of 100 patients, 58 patients had full term deliveries while in 38 patients pre term deliveries occurred. One patient had Eisenmenger syndrome which was diagnosed at 16th week of gestation in which Medical Termination of Pregnancy was done with

Cardiologist's advise. Out of Two cases of Tetralogy of fallot one with 12th week of gestation were advised for termination & Medical termination was done in these case.

One patient with severe Anemia and Mitral stenosis had been diagnosed as 24 weeks of gestation IUD which delivered spontaneously at our institute following admission to the labor room.

Table 6 : Mode of Deliveries in Heart disease

Mode of Delivery	No of Patients	Percentage %
Vaginal Delivery		
1.Vaginal Delivery	47	48.9%
2.Assisted Vaginal Delivery		
-Forceps	07	7.2%
-vacuum	06	6.25%
LSCS	36	37.5%
Total	96	100

In the present study, out of Total 96 Deliveries, 47 were vaginal deliveries. Amongst these 13 were Instrumental Delivery to cut short 2nd stage of labor. Out of 13 Instrumental Delivery 7 were Forceps Delivery and 6 were Ventouse Delivery.

Vaginal delivery is better option than Cesarean section for women with heart disease. The risk of bleeding, infection and thrombotic complications is less and vaginal delivery is not associated with anesthetic complications and acute shift in blood volume that happens during cesarean section. Moreover 36 Lower segment cesarean section were performed. All are done under general anesthesia. Out of 36, only 4 LSCS were done for cardiac indication as advised by cardiologist.

Fetal outcome in present study:

In present study out of 100 fetuses, 86 were delivered live either pre term or full term, 10 babies were still born, 1 abortus IUD and no case was remaining undelivered.

Table 7 : Percentage of NICU admission in present study.

NICU admission	No. of baby	Percentage
Full term	8	8.33%
Preterm	26	27%

In the present study, out of total 86 live birth , 34 babies were admitted in the NICU. Among them, 8 babies were full term and 26 babies were preterm. It indicates that prematurity is the leading cause for NICU admission which is because of cardiac disease .

Neonatal Mortality and its causes:

Neonatal mortality rate in the present study is 8.33%(n=8). There were multiple causes of neonatal mortality including Prematurity, Hyaline membrane disease, Meconium aspiration syndrome and Septicemia. In the present study, total 8 babies expired, out of them 5 babies expired due to Prematurity and Hyaline membrane disease, 2 babies expired due to Meconium aspiration syndrome and Septicemia and 1 baby expired due to congenital anomaly.

In present study total 10 babies were still born and 8 babies expired after admission in NICU. Total 96 viable pregnancy and 1 abortus in present study according to this perinatal mortality in present study is 18.75%.

Table 8 : Maternal mortality in Present study

Cause of Death	No. of Patient
Pulmonary oedema	1
Atrial Fibrillation	1
Primary pulmonary Hypertension leading to congestive cardiac failure	1
Eisenmenger disease	1

In present study 4 patients expired due to cardiac disease, one from Pulmonary oedema, one from Atrial Fibrillation, one from congestive cardiac failure and one from Eisenmenger disease.

In our study period of 1 year, in our tertiary care center total 112 maternal mortality occurred ,out of that only 4(3.57%) maternal mortality were due to cardiac disease. These shown that close monitoring and proper management in antenatal, intrapartum and postpartum period may decrease maternal mortality in cardiac disease with pregnancy.

CONCLUSION

The results of our study indicate that heart disease forms a substantial proportion of medical illness complicating pregnancy. Cardiac disease in the pregnant women pose a challenging task to the obstetrician, the physician, the cardiologist and to the neonatologist. But the majority of pregnancies complicated by Heart disease are uneventful with a favorably good outcome for both the mother and the fetus if appropriate Antenatal and medical care is availed.

This study conclude that Rheumatic heart disease is still a predominant cardiac lesion affecting pregnancy and its outcome. Early detection, treatment like benzathine penicillin and Diuretics, proper follow up and correction prior to pregnancy shall improve outcome and decrease in maternal mortality and morbidity.

Failure to systematically search for cardiac disease in pregnant women has led to late diagnosis and high rates of fatal complications. Therefore, effective screening for cardiac disease in pregnant women is warranted.

Use of prophylactic antibiotics, anti failure treatment during labor may bring down the incidence of infective endocarditis and cardiac failure during antenatal as well as puerperal period.

Educating the community about the cardiac disease and its complications, need for early detection of cardiac lesion, close monitoring during antenatal period, intrapartum period and postpartum care play a vital role in achieving good fetomaternal outcome.

REFERENCES

1. Surge D, Blake S, McDonald D et al. 'Pregnancy complicated by maternal heart disease' at the National Maternity Hospital, Dublin:1969-1978
2. Michel Peter "Experience of CHF in Pregnancy" 1874, 2nd edition 124:126
3. Angus MacDonald "On the Bearing of Chronic Disease of the Heart Upon Pregnancy & Parturition" 1877, 1st edition 150:156
4. Uelen, P M Richardson, B T Le Roux et al. "Pericardiectomy in Pregnancy" Thorax 1970;25:627-630
5. Michael de Swiet "Editorial note Pregnancy and Heart Valve Replacement" International Journal of Cardiology impact factor:4.04 06/1984;5(6):741-743
6. Cesar A Esteves, Auristela I O Ramos, Sergio L N Braga et al. "Effectiveness of percutaneous balloon mitral valvotomy during pregnancy" Am J Cardiol 1991;68:930-934
7. Jessup M, Brozena S "Heart Failure" N Engl J Med 2003 May 15;348(20):2007-18
8. Nassar AH, Hobeika EM, Abd Essamad HM et al "Pregnancy outcome in women with prosthetic heart valves" Am J Obstet Gynecol 2004 Sep;191(3):1009-13
9. Oron G, Hirsch R, Ben-Haroush A et al "Pregnancy outcome in women with heart disease undergoing induction of labour" BJOG 2004 Jul;111(7):669-75
10. Fernando Arias, Shirish N Daftry, Amamath G Bhide "Practical Guide to HIGH-RISK PREGNANCY & DELIVERY" A South Asian Perspective 3rd Edition.