



FETO-MATERNAL OUTCOME IN SURGICALLY CORRECTED CARDIAC DISEASE AT A TERTIARY CARE HOSPITAL IN RAJASTHAN

Obstetrics & Gynaecology

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ABSTRACT

Background: Heart disease is a common and serious clinical condition. Most cardiovascular problems in pregnant women arise from pre-existing chronic conditions (rheumatic heart disease, congenital heart disease and hypertensive vascular disease). The incidence of maternal heart disease in India is about 0.5-1% of all pregnancies⁽¹⁾. Rheumatic heart disease forms majority of patients in this group. It cause chronic valvular lesions commonly affecting the mitral and aortic valves. Objective of present study was to evaluate the burden of cardiac diseases in pregnancy in our hospital and maternal and fetal outcome in patients with surgically corrected cardiac disease.

Methods: An observational study was conducted at Mahatma Gandhi Medical College and Hospital, Jaipur from January 2020. 50 pregnant women with surgically corrected heart disease over the period were included in the study. Detailed demographic data, type of surgical connection, maternal outcome, mode of delivery and neonatal outcome were analyzed in detail.

Result: There were 50 patients of surgically corrected heart disease in our study period out of which 90% were rheumatic heart disease. Mitral stenosis accounted for 90% cases and 82% required BMV, 8% required MVR. Majority of patients 52% belonged to 26-30 years of age group. 50% were primigravida. Pregnancy outcome was uneventful in 92% cases. Among maternal outcome, rhythm disorder were found in 4%, thromboembolic phenomena were found in 2%, cardiac failure in 2%, coagulopathy in 2%, PPH in 8%, puerperal pyrexia in 4%.

1 patient died due to cardiac failure with known case of MS with severe pulmonary hypertension. 52% women were delivered by normal vaginal delivery, 18% were forcep deliveries and 20% underwent caesarean section for obstetric indication. In Neonatal outcome, 62% were full term babies, 38% were pre term babies. 96% were live births, 4% were still births, 2% neonatal death.

Conclusion: Rheumatic heart disease was predominant type. Patients with NYHA class I/II had better fetomaternal outcome.

Surgically treated women tolerate pregnancy well. Fetomaternal outcome can be improved with combined care by obstetrician, cardiologist and neonatologist

KEYWORDS

Cardiac disease, rheumatic heart disease

INTRODUCTION

Heart disease in pregnancy is a common and serious clinical condition. Most cardiovascular problems in pregnant women arise from pre-existing chronic conditions (rheumatic heart disease, congenital heart disease and hypertensive vascular disease). Cardiac disease does not preclude pregnancy but increase risk to both mother and fetus. The incidence of maternal heart disease in India is about 0.5-1% of all pregnancies⁽¹⁾.

In India and other developing countries RHD is most common cardiac disease and it includes majority of patients in this group⁽²⁾. It causes valvular lesions commonly affecting the mitral and aortic valves. Since the natural history of rheumatic mitral stenosis typically has a 20-25 year latent period, symptoms often appear first during pregnancy⁽³⁾.

Recent advances in paediatric cardiology and cardiac surgery have enabled increasing number of women with congenital heart disease to thrive well into their child bearing years. Since the introduction of curative cardiac surgery, more women have been reaching the childbearing age in a more favorable condition to tolerate the haemodynamic burden of pregnancy.

Despite potential for significant maternal morbidity, in most patients with cardiac disease, a satisfactory outcome can be expected with careful antenatal, intrapartum and postpartum management.

Serious complications during pregnancy and postpartum period include congestive heart failure, arrhythmias and strokes. Rate of complication is related to several factors like maternal functional status, myocardial dysfunction, significant aortic or mitral valve stenosis and history of a cardiac event in past.

Detailed assessment of patient throughout pregnancy lead to discovery of heart disease during initial period.⁽⁴⁾ If diagnosed early and managed properly with multidisciplinary approach, collaboration of a team of obstetrician, cardiologist, anesthetist, pediatrician and nurse, it results in successful outcome for mother and child in majority of case.

With this background, we conducted this retrospective study and

collected the data to evaluate the maternal and fetal outcome in women with surgically corrected cardiac diseases in our geographical region. We also studied their detailed clinical presentation, distribution of different cardiac lesions among pregnant women, mode of delivery, maternal and neonatal outcomes.

MATERIAL AND METHOD

This study was conducted in Mahatma Gandhi Medical College and Hospital, Jaipur over a period of 2 years. 50 pregnant women with surgically corrected heart disease, admitted to the Department of Obstetrics and Gynaecology, were included in this study.

Details regarding cardiac disease included type of cardiac lesion, prior cardiac intervention, operative details of surgical correction, type of surgery (valvotomy, commissurotomy, prosthesis) and time of surgery were noted. If cardiac surgery was performed during pregnancy, details about time of surgery, indication for surgical intervention, relation to gestational age were noted.

INCLUSION CRITERIA

- Pregnant women with gestational age >28 weeks.
- Women with surgically corrected rheumatic valvular heart disease.
- Women with surgically corrected congenital heart disease.
- All women with above features who are willing to continue pregnancy.

EXCLUSION CRITERIA

- Women referred for termination of pregnancy.
- Uncorrected MVP
- Uncorrected heart disease

At first antenatal visit, detailed history regarding maternal age, parity, gestational age was recorded

Details regarding cardiac disease included:

1. Type of cardiac lesion
2. NYHA functional class

3. Prior cardiac intervention
4. 12 lead ECG
5. Echocardiographic assessment of systemic (left) and venous (right) ventricular systolic function.
6. Doppler quantification of inflow or outflow obstruction.
7. Doppler quantification of valvular regurgitation
8. Fetal USG, colour Doppler, NST
9. Routine investigations like CBC, Blood sugar, TSH, ABORh, HIV, HBSAg, VDRL, urine routine.
10. Anticoagulant status was monitored according to prothrombin time when patients were on oral anticoagulant.
11. PTT when patient were on heparin.

Antenatal management

Details of anticoagulation prior to and during pregnancy were noted. All patients were followed up regularly with cardiologist and hematologist. Anti-coagulation status was monitored according to PT or INR when patient was on oral anticoagulant and PTT when patient were on heparin.

Details of outcome of pregnancy and delivery were noted

All of these patients were managed by team of obstetrician, cardiologist, pediatrician, anesthetist and ICU care as and when required. Adverse outcomes during the antepartum, intrapartum and post-partum period were classified as maternal complication and perinatal complications and noted.

RESULT

Out of 50 patients, 45 had mitral stenosis , 2 had ventricular septal defect , 1 had atrial septal defect , 1 hap pulmonary stenosis and 1 had coarctation of aorta.

Thus, mitral stenosis was the most common cardiac lesion and out of 45 patients of mitral stenosis , 41 patients (82%) underwent Balloon Mitral Valvotomy.

8% patients underwent mitral valve replacement , 2% patients underwent balloon pulmonary valvotomy , 4% patients had VSD closure ,2% patients had ASD closure and 2% patients underwent coarctoplasty.

Table 1: Surgical Correction Of Cardiac Disease (n=50)

TYPE OF SURGERY	NUMBER OF CASES (50)	PERCENTAGE %
Balloon mitral valvotomy	41	82
Mitral valve replacement	4	8
Balloon pulmonary valvotomy	1	2
VSD closure	2	4
ASD closure	1	2
Coarctoplasty	1	2

Surgical correction of cardiac disease

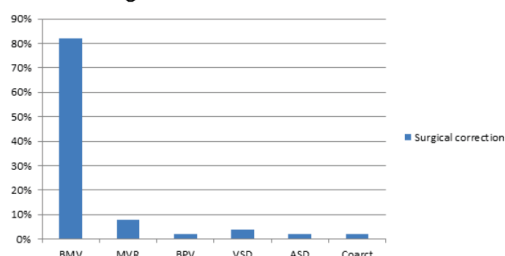


Table 2: Demographic Data (n=50)

	Number (%)
AGE	
21-25	13 (26%)
26-30	26 (52%)
31-35	9 (18%)
>35	2 (4%)
PARITY	
Primi	25 (50%)
Gravida 2	13 (26%)
Gravida 3	9 (18%)
Gravida 4	2 (4%)
Gravida 5	1 (2%)

Table 2, shows that majority of patients belonged to 26-30yrs of age group 52%. 50% patients were Primigravida , 26% were 2nd gravida , 18% were 3rd gravida , 4% were 4th gravida and 2% were 5th gravida.

Table 3: Mode Of Delivery (n=50)

Mode of delivery	Number (%)
Vaginal delivery	26 (52%)
Forcep	9 (18%)
Vacuum	5 (10%)
Cesarean section	10 (20%)

Table 3 shows that 52% patients had normal vaginal delivery , 20% patients had caesarean section , 18% had forceps assisted vaginal delivery, 10% patients had vacuum assisted vaginal delivery.

Mode of delivery

■ vaginal delivery ■ forceps ■ vacuum ■ caesarean section

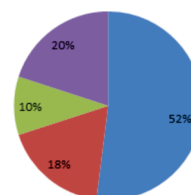


Table 4: Maternal Complications (n=50)

MATERNAL COMPLICATIONS	Number (%)
Rhythm disorder	2 (4%)
Thromboembolism	1 (2%)
Cardiac failure	1 (2%)
Coagulopathy	1 (2%)
PPH	4 (8%)
Episiotomy hematoma	2 (4%)
Puerperal pyrexia	2 (4%)
ICU admission	6 (12 %)
Maternal death	0

Table 4 shows maternal complications recorded in patients, rhythm disorder were found in 4% patients , thromboembolism in 2% patient, cardiac failure in 2 % patient, coagulopathy in 2% patient , PPH in 8% patients , Episiotomy hematoma in 4% patients , puerperal pyrexia in 4% patients. ICU admission was required in 12% patients and no maternal death was observed in our study.

Table 5: Perinatal Outcome

Gestation at birth	
>37weeks	31 (62%)
<37weeks (pre term)	19 (38%)
Birth weight	
<2kg	10 (20%)
2-2.5kg	16 (32%)
2.5-3kg	22 (44%)
>3kg	2 (4%)
Small for gestational age (SGA)	14 (28%)
Stillbirth/IUFD	1 (2%)
Morbidity	
RDS	1 (2%)
Sepsis	6 (12%)
NICU admission	19 (38%)

Table 5 depicts perinatal outcome , 38% babies were pre term , majority of 44% babies had birth weight between 2.5-3kg, SGA babies were 28%, stillborn/IUFD were 2% , 38% babies required NICU admission , 2% babies developed respiratory distress syndrome , 12 % babies developed sepsis.

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⁽⁵⁾

This study reflects the outcome of pregnancy in women with surgically

corrected cardiac disease in our hospital. In present study incidence of cardiac disease was found to be 1.2%. Similar incidence has been reported worldwide⁽⁶⁾.

Our study also showed that rheumatic heart disease is more common than congenital heart disease. Most common dominant cardiac lesion was mitral stenosis, which is comparable to other Indian studies⁽⁷⁾. Mitral stenosis is the most common potentially lethal heart disease. Maternal risks are increased with increasing severity of mitral stenosis (mitral area <1cm).

Certain cardiac diseases are associated with unacceptable fetomaternal outcome, so it is advisable to correct these defects before pregnancy. They are

- Patients in NYHA class III and IV
- Severe left heart obstruction (aortic stenosis with average pressure gradient >50 mm Hg on Doppler ultrasound)
- High grade pulmonary arterial hypertension due to any underlying defect.
- Left ventricular ejection fraction 10mm Hg
- Marfan's syndrome with severe aortic valve involvement
- Severe cyanotic heart diseases.

Pregnant patients with treated cardiac valvular lesion with prosthetic valve required special management guidelines during delivery to avoid complications like thromboembolic events, endocarditis, structure failure, PPH and fetal embryopathy due to prolonged use of oral anticoagulants.⁽⁸⁾

In this study, 2 patients experienced rhythm disorder and were promptly treated, 1 patient had thromboembolism because she was non compliant with anticoagulants, she was admitted in ICU and treated where she recovered completely.

Cardiac failure is a major complication during pregnancy and is often associated with maternal death.

In this study 2% patient had cardiac failure which developed during labor and was managed together by obstetrician, cardiologist and intensivist.

Puerperal pyrexia, episiotomy hematoma and postpartum hemorrhage were unrelated to cardiac disease.

Vaginal delivery was the most common mode of delivery found in 52% cases, followed by caesarean section in 20% cases. This is in accordance with study done by Avila et al⁽⁹⁾. Indication for caesarean deliveries were obstetrical rather than cardiac disease. Regional anesthesia (spinal/epidural) given by cardiac anesthetist ensures acceptable fetomaternal outcome.⁽⁴⁾

In present study 38% babies were born preterm and 28% babies had growth retardation and 2% were stillborn. Out of 49 live born babies 19 were admitted to NICU. 12% neonates had sepsis and 2% neonates had respiratory distress syndrome. All neonatal complications were more common in pregnant women in NYHA class III and IV which can be attributed to use of cardio active drugs as digitalis, diuretics and beta blockers, hemodynamic compromise, placental insufficiency and early onset of labor.⁽¹⁰⁾

In general population, the incidence of cardiac defects is 0.8% which increases to 3-5% in babies born to women with cardiac defects. Detailed fetal echocardiography at 22 – 24 weeks of gestation is recommended to diagnose these babies during antenatal period.⁽¹¹⁾

Majority of pregnancies complicated by heart disease in this study had uneventful course with favorable maternal and fetal outcome. Early diagnosis, presence of specialized multidisciplinary team, cardiac ICU and well equipped NICU may have contributed to decreased maternal and neonatal morbidity and mortality.

CONCLUSION

Pre-pregnancy counselling should be universally offered to all women with heart disease to prevent avoidable pregnancy related risks and plan their lives. Early recognition, appropriate pre-pregnancy corrective surgery if required, timely referral to higher centers having multidisciplinary management approach reduces the adverse maternal and neonatal events. Attention must be paid to detailed examination to

diagnose cardiac disease which develops de-novo during pregnancy. This is because these patients have the first contact with health care providers during pregnancy.

ACKNOWLEDGEMENT

We are thankful to all the participants of the study.

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