

MATERNOFETAL OUTCOME IN PATIENTS WITH CARDIAC DISEASES IN A TERTIARY CARE HOSPITAL

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Contribution

NL conceived the idea, planned the study and drafted the manuscript. SBK & RR collected data, did statistical analysis and critically reviewed manuscript. All authors contributed significantly to the submitted manuscript.

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ABSTRACT

Objectives: The aim of this study was to determine the maternal and fetal outcome in pregnant cardiac patients.

Methodology: This cross sectional study was carried out in Gynae B unit of Lady Reading Hospital from January 2013 to 2016. All cardiac patients with evidence of cardiac problem on echocardiography, presenting to labour suit were included. Patients presenting for termination of pregnancy before 24 weeks of gestation were excluded from the study. Complete cardiovascular and obstetrical examination was carried out. NYHA class was determined at the time of presentation. Maternal and fetal outcomes like C-section, postpartum haemorrhage, pulmonary oedema and maternal death, prematurity, still birth and low birth weight were studied. Chi square test was applied for analyzing the data

Results: A total of 98 pregnant ladies with cardiac diseases were included. Out of 98 patients, 22% were newly diagnosed with cardiac disease while 78% were already diagnosed cardiac patients at time of study. About 69% of the patients were in the NYHA class I, II and 31% were in NYHA III, IV. Acquired heart lesions were present in 81% patients and congenital heart defects in the remaining 19% cases. Mitral stenosis being the most common problem accounting for 51% of cases. Peripartum cardiomyopathy was present in 12% of cases. Postpartum haemorrhage occurred in 22.4% of the patients, 15.3% of the patients developed pulmonary oedema. The still birth frequency was 18%. Maternal death occurred in 4(4%) of the cases ($p < 0.01$).

Conclusion: While some of the complications related to cardiac diseases in pregnant patients are unavoidable, proper pre and post pregnancy counseling can make a huge difference.

Key Words: Cardiac diseases, Maternal outcome, Fetal outcome.

INTRODUCTION

Cardiac diseases complicates about 1-4% of all pregnancies. With advances in cardiac medicine we are now seeing more cardiac patients with pregnancy because of improved care of the patients with acquired heart problems and skilled correction of congenital cardiac lesions. However despite all the advances cardiac disease in pregnancy is the second most common non direct cause of maternal death, second only to suicide across the world and is responsible for 10-25% of maternal deaths.^{1,2}

As normal pregnancy and puerperium is associated with significant cardiopulmonary changes, which can unmask underlying cardiac problem in otherwise normal women and can lead to increased morbidity and mortality in pregnant women with known cardiac diseases. Though death is a rare occurrence in appropriately managed cases, however maternal and fetal complications are substantial.³

The maternal complications of pregnancy in a cardiac patients include the obstetrical/non cardiac complications and cardiac complications. Congestive cardiac failure, pulmonary oedema, death due to cardiac disease are among the cardiac complications. Induction of labour, instrumental deliveries for shortening second stage of labour and postpartum hemorrhage are some of the more frequently seen obstetrical complications in cardiac patients.³

Among the fetal complications, intrauterine growth restriction and preterm birth are the commonest. Preterm delivery is most often iatrogenic. Fetal growth restriction and prematurity are responsible for increased perinatal morbidity and mortality. Adverse neonatal outcome occurs in 20 to 30% of cardiac patients.³ The strongest predictors for adverse perinatal outcome are maternal cyanosis, left heart obstruction, mechanical valves, oral anticoagulants and multiple pregnancies.⁴

Child bearing women with cardiac disease present unique challenge to the health care. The physiological adaptations of pregnancy predispose cardiac patients to decompensate. If diagnosed early and managed properly with multi disciplinary approach, optimal outcome can be achieved in majority of cases.⁵

The rationale of the study was to assess the maternofetal outcome in pregnant cardiac patients in our hospital so to be able to provide evidence based information to the patients and also to identify the potential areas of improvement.

METHODOLOGY

This cross sectional study was carried out in Gynae B unit of Lady Reading Hospital from January 2013 to 2016. All cardiac patients with evidence of cardiac problem on echocardiography, who presented to labour suit for delivery

were entered into the study. Patients presenting for termination of pregnancy before 24 weeks of gestation were excluded from the study. Informed consents were taken from the patients.

The patients included in the study either had a known cardiac problem or their cardiac disease was diagnosed in the index pregnancy. Patients came from a variety of sources. Some presented to labour room in emergency with labour pains, some were admitted for elective deliveries and some were shifted from the cardiology department or emergency department for delivery. All these patients were then thoroughly assessed. Detailed history about the cardiac problem, medication and intervention was taken. Complete obstetrical history including parity, gestational age from first trimester scan or LMP where dating scan was not available, previous obstetrical outcome was taken. Complete cardiovascular and obstetrical examination was carried out and antenatal management plan for delivery where available was reviewed. The nature and severity of the cardiac problem was identified in the view of available record and most recent Echocardiography report. NYHA class was determined at the time of presentation. Most of the patients were already under the care of a multidisciplinary team consisting of cardiologist, obstetrician and anaesthetist, with a precise delivery plan. For patients who presented in emergency without any prior proper evaluation and plan, such a multidisciplinary care was arranged involving the senior most on call obstetric consultant and cardiologist. All these patients were kept in high dependency unit of the labour suit. All these patients were given pain relief during labour and antibiotic prophylaxis where indicated in accordance with the cardiologist advice. Fluid overload was avoided. Instrumental delivery was undertaken if maternal efforts were inadequate. Ergometrine was avoided. Patients were observed for maternal and fetal outcome. The patients in NYHA I and II category were retained for the first 24 hours after delivery in the high dependency unit and then shifted to postnatal ward. From there they were discharged on 4th or 5th postnatal day. NYHA III and IV class patients were shifted to cardiology unit for further cardiac care.

All the information was collected on pre formed performa. Maternal outcome in terms of induction of labour, C. section, postpartum haemorrhage, pulmonary oedema and maternal death was studied. Fetal outcome in terms of prematurity, still birth and low birth weight was studied.

A blood loss of more than 500 ml after delivery or an Hb drop of more than 1 gm after delivery was defined as postpartum haemorrhage. Pulmonary oedema was defined as dyspnoea with basal lung creptations on auscultation and reduced oxygen saturation on pulse oximetry. Birth before 37 completed weeks was taken as premature and weight less than 3 kg at or more than 37 weeks gestation was taken as low birth weight. For preterm births, weight less than the

reference range specific for that gestation was taken as low birth weight.

All the data was analyzed on SPSS version 16. Percentages for the categorical variables were calculated and Chi square test was applied to determine the maternal and fetal outcome in relation to the severity of functional class.

RESULTS

We had total of 98 cardiac patients with pregnancy in our study. Acquired valvular heart disease or Rheumatic heart disease was present in 81.6% of patients, with isolated mitral stenosis being the most common, present in 51% of the cases. Other acquired valvular defects included MR(10%), MS combined with MR(6%). Peripartum cardiomyopathy was present in 12% of patients. Ischemic heart disease was identified in 2% of the cases. Congenital cardiac defects accounted for 18.3% of the cases with ASD the most common (8%), followed by PDA (4%) while VSD, Primary

pulmonary artery hypertension and coarctation of aorta was present in 2% of the patients (Table 1). About 69% of the patients were in the NYHA class I and II and 31% of the patients were in NYHA III and IV.

Labour was induced in 30% of the patients, while the rest 70% had spontaneous onset of labour. Most of the inductions (80%) were for the cardiac reasons and only 20% were for the obstetrical reasons like PROM, Post dates and recurrent p/v bleeding. Most of the patients (85%) had vaginal delivery and 15% had C.section. Postpartum hemorrhage occurred in 22.4% of the cases, pulmonary oedema in 15% of the cases and 4(4%) patients died because of cardiac complication in the study period.(Table 2).

The still birth rate was 18%, and Low birth weight rate was 51%. Preterm delivery occurred in 16 % of the cases.(Table 3).

Table 1: Cardiac Diseases in Study Population (n=98)

M. Outcome	NYHA I&II (n)	NYHA III&IV (n)	Total (n)	Percentages (%)
Induction of Labour	17	13	30	30.6%
C. Section	14	01	15	15%
PPH	20	02	22	22.4%
Pulmonary Oedema	02	13	15	15.3%
Death	0	04	04	04 %

Table 2: Maternal Outcome in Study Population (n=98)

	Frequency (n)	Percentages (%)
ACQUIRED	80	81.6%
Rheumatic valvelesions	66	67%
Mitral stenosis	50	51%
Mitral Regurgitation	10	10%
MS+ MR	06	6%
Peripartum cardiomyopathy	12	12%
Ischeamic heart diseases	02	2%
CONGENITAL	18	18.3%
ASD	08	8%
VSD	02	2%
PDA	04	4%
Coarctation of aorta	02	2%
Primary P artery HTN	02	2%

Table 3: Fetal Outcome in Study Population (n=98)

Fetal Outcome	NYHA I&II (n)	NYHA III&IV (n)	Total (n)	Percentages (%)
Stillbirth	8	10	18	18%
Preterm	15	19	34	16%
Low birth weight	25	26	51	51%

DISCUSSION

In our study rheumatic heart disease remains the most frequent cause of valve disease and mitral stenosis was the most common lesion as is reported from other centers of this region.⁶⁻⁸ Rheumatic heart disease is still endemic in Pakistan and is the most common potentially lethal heart problem in pregnancy. Maternal risks are raised directly with the severity of mitral stenosis. It is therefore advisable to correct the severe lesions before pregnancy. Percutaneous mitral balloon valvotomy has emerged as treatment of choice for severe mitral stenosis and should be offered to eligible patients.⁹

In developed countries because of successful surgeries of congenital cardiac lesions and low incidence of rheumatic heart diseases, congenital cardiac diseases comprise 70-80% of cardiac patients in pregnancy.¹⁰ Such is not the case here. Only 18.3% of the patients in our study were with a congenital cardiac condition. ASD, VSD, PDA were seen in patients. There were two patients with primary pulmonary artery hypertension. Our study results are in line with many other studies on the subject in this region.⁶⁻⁸ Pregnancy in patients with congenital cardiac disease represent a new challenge in this group as the natural history of the disease has been modified by surgery.

Cardiomyopathy is a rare and potentially lethal cardiac complication of late pregnancy and early postpartum period. Twelve cases were seen during the study period and majority responded well to treatment while one patient expired in the early postpartum period. She presented in emergency in labour, at term gestation with twin pregnancy and poor NYHA functional class. Compared to other studies the frequency of peripartum cardiomyopathy in our study was higher and the outcome was better.^{7,8}

Poor functional class in addition to severity of lesion is a significant risk factor for both mother and fetus. In our study 30 patients were induced. Out of all 80%(24) inductions were carried out for cardiac reasons and only 20%(6) for obstetric indications. The obstetric indications included PROM (3), recurrent vaginal bleeding (2) and Post dates (1). Postpartum hemorrhage occurred in 15% of patients, mainly due to uterine atony and perineal tears. Induction of labour, instrumental deliveries and omission of ergometrine from the active management of third stage of labour were the identifiable risk factors for PPH. Out of total, 22.4% patients had C.section. All of these were for obstetric indications. Four sections were done for failed induction, four for malpresentations, two for antepartum haemorrhage, two for fetal distress and three for obstructed labour. The C.section rate in cardiac patients of our study is lower compared to some other studies where its reported 35% ,34% and 76%^{8,11,12}. This can be due to variations in the obstetrical conditions in these patients.

In our study 15.3% of patients developed pulmonary oedema. Thirteen out of fifteen patients who developed pulmonary oedema were in the functional class III and IV. Among the patients who developed pulmonary oedema two were with peripartum cardiomyopathy, four patients were with congenital cardiac problems and remaining were with severe mitral stenosis and pulmonary hypertension.

About 4 patients died during the study period. This rate is similar to that found in a study done by W Tayyiba in Pakistan and Y. Ali reza in Iran showing similarities in the level of health care in this region of the world.^{6,12} Out of the four patients who died two were with pulmonary artery hypertension who had conceived against the advice of their cardiac physician and had been non compliant with the antenatal care. In both cases the patients presented early in the third trimester in serious condition. Delivery was decided. Induction of labour was decided jointly by obstetrician and cardiologist keeping in view the substantial risks of anaesthesia and surgery in these patients. One of these two died before the commencement of induction while the other died in the first 24 hours after delivery. One death was due to peripartum cardiomyopathy and one was due to thromboembolism.

The results for adverse fetal outcome like stillbirth and low birth weight were not very encouraging in our study being 18% and 51% respectively. In a study conducted by Mazhar SB et al the stillbirth rate was 8% and the low birth weight was 29%⁷. In another study the frequency of Still birth was 6.3%.⁶

LIMITATIONS

Our study had certain limitations, as it was an observational study with no control group and this fact limits the interpretation and extrapolation of data. Nevertheless, this number of patients followed and managed in the same institute by a similar group of physicians provide an insight into the need to improve our care of cardiac patients.

CONCLUSION

Cardiac disease remains the commonest cause of maternal death. While some deaths are unavoidable, pre-pregnancy counseling for women with acquired or congenital heart disease is important and counseling should be viewed as the mainstay of clinical practice. Proper evaluation of cardiac patients prior to conception and adequate follow up during pregnancy are both fundamental measures for obtaining optimal outcomes in these patients. All cardiologists should recognize the need to raise the issue of pregnancy whenever a diagnosis of acquired heart disease is made in a woman of childbearing age. Although women with heart disease are at increased risk during pregnancy, the majority of women will have a good outcome with careful management.

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