Maternal And Fetal Outcome In Pregnancies Complicated With Maternal Cardiac Diseases: Experience At A Tertiary Care Hospital

R Khursheed, A Tabasum, B Zargar

Citation

R Khursheed, A Tabasum, B Zargar. *Maternal And Fetal Outcome In Pregnancies Complicated With Maternal Cardiac Diseases: Experience At A Tertiary Care Hospital*. The Internet Journal of Gynecology and Obstetrics. 2015 Volume 19 Number 1.

DOI: 10.5580/IJGO.17947

Abstract

Background: Maternal and neonatal complication rates are increased in pregnant women with heart disease. Multidisciplinary approach can optimize the patient care

Aims: To analyze the outcomes of pregnancies complicated with maternal cardiac diseases.

Methods and results: Pregnancy outcomes were retrospectively analyzed in 132 consecutive pregnancies admitted from January 2011 to January 2014. Women were classified according to pre-defined risk predictors as high-risk group having 35patients(left ventricular [LV] ejection fraction <50%, NYHA class>II or cyanosis) or low-risk group with 97 patients(not meeting these criteria). Primi gravida patients accounted for 48.48 %(64) and 28.03%(37) patients were second gravida. Majority of our patients had rheumatic etiology(71.96%) and Mitral stenosis was the most common lesion accounting for 43.15% patients.Maternal complications included Congestive cardiac failure in 58(43.9%), Respiratory tract infections in 28(21.20%), Pulmonary embolism in 2(1.51%) and Post-partum infective endocarditis in 1(0.75%) patient .

Conclusions: Rheumatic heart diseases still remain common in developing countries with high complication rates in pregnancies complicated with heart diseases. Accurate assessment and categorization as high and low risk with intensive multidisciplinary approach leads to optimization of treatment protocols leading to improved maternal as well as fetal outcomes.

INTRODUCTION

Heart diseases are the most important non-obstetrical causes of maternal deaths during pregnancy. Prevalence of heart disease in pregnancy vary from 0.3–3.5 % [1,]. Diagnosis of heart disease during pregnancy is a challenge as common clinical features of cardiac lesions like breathlessness, pedal edema, and murmurs mimic normal pregnancy .Cardiac output increases by 30-50% during pregnancy and a further increase during labor and delivery imposes a burden on the diseased heart leading to complications and death. Cardiac disorders contribute to approximately 20.5% of maternal deaths[2,].

In developing countries like India, Rheumatic heart diseases still accounts for majority of such cases and mitral stenosis is the most frequently observed valvular lesion. In the western countries majority of such cases have congenital heart diseases.

In pregnancies complicated with cardiac disorders, maternal and perinatal mortality and morbidity depends on the type of disorder, the functional status of the patient and the complications associated with the pregnancy.

In order to study the maternal and perinatal morbidity and mortality associated with pregnancies complicated with cardiac diseases, this retrospective study was done at a tertiary care centre in India.

MATERIAL AND METHODS

The study was conducted in the department of gynaecology and obstetrics Sher-i-Kashmir Institute of Medical Sciences Srinagar India. A total of 132 pregnancies complicated by heart disease were evaluated retrospectively between January 2011 and January 2014. A detailed analysis of

antenatal follow-up records and medical records of both mother and newborns was done. Based on the symptoms all the patients were classified into four groups according to New York Heart Association (NYHA) functional Classification.

Data collected included information regarding maternal age, parity, presence of hypertension (BP>140/90 mm Hg), nature of cardiac disease, NYHA class, cardiac medication, any prior cardiac intervention and anticoagulation therapy. All women were subjected to a battery of tests that included complete blood counts, coagulation profile, electrocadiography and echocardiography. Foetal echocardiography was done in patients with congenital heart diseases.

During the antenatal period, all the patients were followed up by a cardiologist and an obstetrician. Decisions regarding anticoagulation, the time of delivery and route of delivery were planned jointly. Antibiotic prophylaxis against infective endocarditis was given to all the patients at the time of labour. Patients were evaluated for development of any medical complication, obstetrical complication, gestational age at delivery, mode of delivery and postpartum complications.

Perinatal outcomes were analyzed in terms of prematurity, fetal growth restriction, still birth, neonatal deaths, birth weight and birth defects.

A pediatrician examined all the neonates at the time of birth.

RESULTS

The study analyzed 132 pregnant females complicated by heart diseases. A total of 103 patients (78.03%) were between 20 -30 years (Table 1). Primi gravida patients accounted for 48.48 % (64) and 28.03% (37) patients were second gravida (Table 2).

Majority of our patients had rheumatic etiology (71.96%) whereas congenital heart defects accounted for 24.24% patients (table 3).Among Rheumatic patients Mitral stenosis was the most common lesion accounting for 43.15% patients followed Mitral regurgitation (13.68%). Combined lesion of Mitral stenosis and regurgitation was seen in 8.42% of patients with rheumatic etiology.

Out of 132 patients, 97(73.42%) were in low risk group (NYHA class 1 and 2, no cyanosis and LV ejection fraction >50%) whereas 35(26.52%) patients were in high risk group which included patients in NYHA class >2 or cyanosis or LV ejection fraction <50 %. (Table 4)

Patients were receiving following cardiac drugs DIGOXIN in 75(56.81%), DIURETICS in 78(59.09%), ANTICOAGULANTS in 16(12.12%). (Table 6)

Prior heart surgery was done in 12(9.09%) patients and 4(3.O3%) patients had history of hospitalization for treatment of heart failure.

Normal vaginal delivery was conducted in 46(42.99%) patients out of which 13(12.11%) pregnancies needed induction of labour and 23(21.49%)patients required instrumentation of one form or the other(vacuum or forceps). Lower segment cesarean section was performed in 61(57.01%) patients. (Table 7)

Obstetrical complications (table 9) encountered were Pregnancy induced hypertension (PIH) in 14(10.60%), Placenta previa in 5(3.78%), Breech presentation in 3(2.27%), Twin pregnancy in 2(1.51%) and Post-partum heamorrage in 9(6.8%) patients. Out of the total 132 patients 7(5.3%) had history of previous cesarian section. There was only 1(0.75%) maternal death in the study group with postpartum infective endocarditis as the cause of death

Maternal medical complications arising in the antenatal, perinatal and post-partum period included. Congestive cardiac failure in 58(43.9%), Respiratory tract infections in 28(21.20%), Pulmonary embolism in 2(1.51%) and Post-partum infective endocarditis in 1(0.75%) patient. (Table 10)

In terms of fetal outcomes, 21(19.6%) babies were born premature and 46(42.99%) babies were small for gestational age at birth. There were 2(1.86%) still births and 5(4.67%) neonatal deaths. Two (1.86%) infants were diagnosed as having congenital heart defects. (Table 8)

DISCUSSION

Most of the studies estimate that 0.3 and 3.5 % of all pregnancies are complicated by heart disease and it accounts for 15 % of pregnancy-related mortality [3]. The type of cardiac lesion varies with study population with congenital heart diseases accounting for most of the cases in the western populations. Our study again confirms that rheumatic heart disease is still predominant in developing counties like India accounting for 71.96% of our patients in the study. Congenital heart diseases accounted for about quarter of our patients.

Optimal care of pregnancies complicated by maternal cardiac diseases demands multidisciplinary approach involving close cooperation between the obstetrician, cardiologist, intensivist and the anesthetist. Accurate assessment and stratification of patients into high and low risk categories helps in optimization of treatment protocols and hence reduction in maternal and foetal mobidity and mortality. In a prospective multicentre study enrolling 562 women with heart disease monitored in 13 Canadian hospitals, Siu et al. identified poor functional NYHA class or cyanosis, left ventricular systolic dysfunction, and left heart obstruction as major determinants for maternal cardiac complications [4].

In our study, patients with NYHA Class 1 and 2 symptoms without cyanosis and LV ejection fraction >50%were categorized as low risk (73.42%) and those with class 3 and 4 symptoms or cyanosis or LV ejection Fraction <50% as high risk patients (26.52%). A total of 37.1% (36 out of 97) of the high-risk group suffered from maternal complications in comparison to only 11.4%(4 out of 35) of the women at low-risk. The only maternal death was from the high risk group and the cause of death was post-partum infective endocarditis.

Most of the pregnancies complicated with maternal heart disease go into spontaneous labor and deliver vaginally. Although induction of labour is not generally indicated yet in some selected patients trial with induction can be given under close monitoring. Induction of labor with PGE2 intracervical gel has been found safe and effective in this study.In our study normal vaginal delivery was conducted in 46(42.99%) patients out of which 13(12.11%) pregnancies needed induction of labour and 23(21.49%)patients required instrumentation of one form or the other(vacuum or forceps). Lower segment cesarean section was performed in 61(57.01%) patients

The two major neonatal complications seen in these patients are premature and low birth weight babies. In our study in terms of fetal outcomes, 21(19.6%) babies were born premature and 46(42.99%) babies were small for gestational age at birth. There were 2(1.86%) still births and 5(4.67%) neonatal deaths. Two (1.86%) infants were diagnosed as having congenital heart defects.

Pregnant women with minimal symptoms due to heart disease have a mortality rate of about 1%, which is almost the same as in healthy general population [5,6,]. But patients with severe symptoms have higher mortality risk of 5-15% [7]. In our study there was only one maternal death. Such a low mortality rate probably is a result of intensive multi-disciplinary approach adopted in our institute.

Pregnancy leads to marked hemodynamic changes, especially in the third trimester. Congestive cardiac failure was the most common cardiac complication encountered, viz. 58(43.9%) patients. In the majority of cases it was mild and resolved spontaneously after the termination of pregnancy

Pregnancy being a hypercoagulable state leads to increased risk of pulmonary embolism in pregnancies complicated with heart diseases. The risk is more in patients with prosthetic valves and despite heparinisation some patients develop pulmonary embolism In our study pulmonary embolism was seen in 2(1.51%) patients. Drenthen et al. found in his overview a rate of 2.2% (n=15) thromboembolic complications in 688 completed pregnancies in women with congenital heart disease [8].

Post-partum infective endocarditis developed in 1(0.75%) patient who had underwent prosthetic mitral valve replacement earlier.

Pregnant women with minimal symptoms due to heart disease have a mortality rate of about 1%, which is almost the same as in healthy general population. But patients with severe symptoms have higher mortality risk of 5-15% [9].In our study there was only one maternal death. Such a low mortality rate probably is a result of intensive multi-disciplinary approach adopted in our institute.

CONCLUSION

In a developing country like India, Rheumatic heart diseases still account for a majority of pregnancies complicated with maternal heart diseases. There is increased mortality and morbidity associated with such pregnancies. Early and accurate categorization of these patients, into high and low risk, is of great importance as it enables the treating team to anticipate and manage complications in a better way. In order to achieve optimal results, pregnant women with cardiac diseases having high risk factors need specialized multi-disciplinary team approach which includes specialized cardiologic care, high-risk obstetric support, and neonatologic expertise with close monitoring.

TABLES

Table 1

Age distribution of the patients

Age	No. of patients
<20	3(2.27%)
20-24	34(25.75%)
25-29	69(52.27%)
>30	26(19.69%)

Table 2

Gravida status of the patients

GRAVIDA	No. of patients
G1	64(48.48%)
G2	37(28.03%)
G3	26(19.69%0
G4	3(2.27%)
G5	2(1.51%)

Table 3

Etiology of Cardiac disease

Rheumatic	95(71.96%)
Congenital	32(24.24%)
Others	5(3.78%)

Table 4

NYHA functional class of the patients

CLASS 1&2	97(73.42%)
CLASS 3	28(21.21%)
CLASS4	7(5.31%)

Table 5

Pregnancy outcomes

Spontaneous abortion	10(7.5%)
Therapeutic abortion	15(11.36%)
Preterm delivery	21(15.9%)
Term delivery	86(65.15%)

Table 6

Patients on cardiac medications

RECEIVING CARDIAC MEDICINE	No. of patients
NONE	19(14.39%)
DIGOXIN	75(56.81%)
DIURETICS	78(59.09%)
ANTICOAGULANTS	16912.12%)
PRIOR CARDIAC SURGERY	12(9.09%)

Table 7

Mode of delivery

MODE OF DELIVERY(N=107)	
TOTAL VAGINAL DELIVERIES	46(42.99%)
INDUCED LABOUR	13(12.11%)
INSTRUMENTAL DELIVERY	23(21.49%)
LSCS	61(57.01%)

Table 8

Fetal complications

PREMATURITY	21(19.6%)
SMALL FOR GESTATIONAL AGE	46(42.99%0
STILL BIRTHS	2(1.86%)
NEONATAL DEATHS	5(4.67%)
CONGENITAL HEART DISEASE	2(1.86%)

Table 9

Associated obstetrical complications

ASSOCIATED OBSTETRICAL COMPLICATIONS	
PIH	14(10.60%)
PLACENTA PREVIA	5(3.78%
BREECH	3(2.27%)
TWIN PREGNANCY	2(1.51%)
PPH	9(6.8%)
PREVIOUS CAESAREAN SECTION	7(5.3%)

Table 10

Maternal medical complications

MATERNAL MEDICAL COMPLICATIONS	
CONGESTIVE CARDIAC FAILURE	8(6.06%)
RESPIRATORY TRACT INFECTIONS	28(21.20%)
PULMONARY EMBOLISM	2(1.51%)
MATERNAL DEATH	1(0.75%)
POSPARTUM INFECTIVE ENDOCARDITIS	1(0.75%)

References

1. Surge D, Blake S, McDonald D. Pregnancy complicated by maternal heart disease at the National Maternity Hospital,

Dublin; 1969–1978.
2. 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. J Perinatol 2012;32:163-9.
3. Stangl V., Baumann G., Stangl K. Pregnancy risks in acquired heart diseases. Z Kardiol 2001;90:16-29
4. Siu S.C., Sermer M., Colman J.M., et al. Prospective multicenter study of pregnancy outcomes in women with heart disease. Circulation 2001;104:515-521.
5. Clark S.L. Cardiac disease in pregnancy. Crit Care Clin 1991;7:777-797.
6. Barbosa P.J., Lopes A.A., Feitosa G.S., et al. Prognostic factors of rheumatic mitral stenosis during pregnancy and puerperium. Arq Bras Cardiol 2000;75:215-224.
7. Sawhney H., Aggarwal N., Suri V., et al. Maternal and perinatal outcome in rheumatic heart disease. Int J Gynaecol Obstet 2003;80:9-14.
8. Drenthen W., Pieper P.G., Roos-Hesselink J.W., et al. Outcome of pregnancy in women with congenital heart disease: a literature review. J Am Coll Cardiol 2007;49:2303-2311.
9. Sawhney H., Aggarwal N., Suri V., et al. Maternal and perinatal outcome in rheumatic heart disease. Int J Gynaecol Obstet 2003;80:9-14

Author Information

Rabia Khursheed, Assistant Professor
Department of Gynecology and Obstetrics, Sher-i-Kashmir Institute of Medical Sciences
Srinagar, India
drbabarzargar@gmail.com

Aaliya Tabasum, Senior Resident
Department of Gynecology and Obstetrics, Sher-i-Kashmir Institute of Medical Sciences
Srinagar, India

Babar Zargar, MCh
Department of Cardiovascular and Thoracic Surgery, Sher-i-Kashmir Institute of Medical Sciences
Srinagar, India