

FETOMATERNAL OUTCOME IN PREGNANCY WITH CARDIAC DISEASE

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Summary

Aim of our study was to see the maternal and fetal outcomes in women presenting with heart disease during pregnancy and labour. This cross sectional study was carried out in 48 pregnant women with cardiac disease from July 2005 to Dec 2006, in the department of Gynae and Obst at Chittagong Medical College Hospital Chittagong. The Mean age was 25.40±4.46 years. 31 (64.6%) patients were from middle class. 27 (56.3%) patients belonged to nulliparous group. 33(68.8%) patients received regular antenatal care, of the 43 (89.7%) patients had rheumatic heart disease and 5(10.5%) had congenital heart disease. Among the rheumatic heart disease, 50% had mitral stenosis. 35(72.9%) patients had in grade-I, 12(25%) had in grade-II, and 1(2.1%) had in grade-III. (64.5%) had normal vaginal delivery, 7(14.5%) had LSCS. 4(8.3%) had heart failure and 1patient (2.1%) expired due to heart failure. 40(83.3%) were delivered at term, 7(14.6%) had preterm labour and 1(2.1%) had still birth. Regarding birth weight, 17(35.4%) had LBW (Low birth weight), 31(64.6%) had normal birth weight. Rheumatic heart disease is the commonest cardiac lesion among Pregnant women. Fetomaternal morbidity and mortality are strongly correlated with maternal cardiac functional classification. The management of these cases should be multidisciplinary to optimize care of these patients.

Key words

Pregnancy; heart disease; fetomaternal.

Introduction

Pregnancy causes few important changes in a women's cardiovascular system which is usually reversible or transient but this changes imposes an additional burden on the cardiovascular system.

Circulating blood volume increases up to 50% by the end of pregnancy. Pregnant women who have cardiac disease must be able to accommodate these normal changes to have a successful pregnancy. Inability to do so can result in increased morbidity and mortality. Cardiac disease is an important cause of nonobstetric mortality during pregnancy and can result in significant morbidity^{1,2}. Cardiac diseases complicate 1-4% of all pregnancy in the US¹. In women with pre-existing heart disease maternal mortality is about 1% in developed countries, accounting for upto 10% of all maternal mortality^{2,3}. The hemodynamic burden of pregnancy and labour aggravate symptoms and precipitate complication in a women with preexisting heart disease which ultimately increase the pregnancy related morbidity and mortality^{4,5}. In pregnancy with heart disease is a great concern for the obstetrician as it is the most important non-obstetric cause of morbidity & death in pregnant women occurring in 0.4-4.0 % pregnancies⁶.

Bangladesh being a developing country, majority of the patients are poor and health facilities are still inadequate. So the morbidity & mortality in pregnancy related heart disease much more higher than developed country⁷.

Heart disease are classified as congenital (operated or un-operated) or acquired. Acquired diseases can be infectious, autoimmune, degenerative, or idiopathic. The main problems encountered in a pregnant women with heart disease arise from complications of already existing chronic disorders like rheumatic and congenital heart lesions and hypertensive cardiovascular diseases⁸.

Rheumatic heart disease has been the main causes of heart lesion in pregnancy and it is the leading causes of death due to heart disease in young women in developing countries⁹. The most common rheumatic lesion is mitral stenosis 80%, followed by aortic stenosis 10%, mitral regurgitation (6.6%) & aortic regurgitation (2.5%)¹⁰.

Maternal & foetal health are significantly influenced by pregnancy with heart disease and previously physician were use to advise the women with heart lesion not to pregnant due to its complication. But now a days with the better understanding and management of pregnant women with heart disease can have a normal pregnancy¹¹.

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A great extent of morbidity and mortality of pregnant women with heart disease can be preventable by a close monitoring during pregnancy period and optimum management during labour. For this a good multi disciplinary medical team comprising obstetrician, cardiologist, medicine specialist, anesthetist are required¹².

A study on the effect of valvular heart disease on maternal and fetal outcome of pregnancy was done in the USA in 2001. The results of the study were as follows: women with valvular heart disease had a significantly higher incidence of congestive heart failure, arrhythmia¹³. Mortality occurred in only one patient with aortic stenosis. Valvular heart disease had an effect on fetal outcome resulting in an increased preterm delivery, intrauterine growth restriction and reduced birth weight. Increased maternal morbidity and unfavorable fetal outcome were seen mostly in patients with moderate and severe mitral stenosis and aortic stenosis.

In Bangladesh few studies were done in different hospitals, 14 but no study was carried out in Chittagong Medical College Hospital. Our aim was to see the maternal & foetal outcome in pregnancy with heart disease. Though the study population was small and not representative to the whole population, the results may give an idea about the risk of pregnancy in heart disease in our settings which may encourage the effected mother to have a successful pregnancy and to live a good life.

Materials and methods

Over a period of one and half year, a cross sectional study based on purposive sampling technique was conducted at the Department of Gynae & Obst, Chittagong Medical College Hospital Chittagong. Predesigned proforma was filled in for each patient with observational facts. Detailed history and Clinical examination was undertaken in all patients and graded by New York Heart Association Functional classification. All patients with heart disease were seen by the cardiologist and diagnosis confirmed by clinical examination and echocardiography.

Proforma included the background information regarding age, socioeconomic condition, parity, booking status, obstetric, history, relevant past medical, surgical history and family history. In particular, the types of heart disease encountered, clinical presentation of the patients, grading according to the NYHA functional classification admission in antenatal ward and obstetric and medical complications were recorded in these women during pregnancy, labor and immediate postpartum period.

Maternal outcome included medical and obstetric complication and maternal mortality. Fetal outcome measurer included prematurely, intrauterine growth restriction, intrauterine death and prenatal mortality and indicated termination of pregnancy were recorded. Mode of delivery, Apgar score of neonates, their birth weight, gestation at birth in weeks and admission to neonatal intensive care unit were also studied in all patients.

All collected data were analyzed, utilizing statistical program for social sciences (SPSS) version 10, in the form of percentages (relative frequencies) of variables.

Results

During this study period total number of obstetrical patients admitted were 17398. There were 69(0.39%) pregnancies with heart disease. We analysed 48 pregnancies where details of antenatal events and deliveries were available. Majority of patients had rheumatic heart disease are 43 patients (89.7%). Out of which 24(40%) had mitral stenosis. Fifteen patients (31.3%) had mitral stenosis (MS) with mitral regurgitation (MR) 2(4.2%) had MR 1(2.1%) had atrial septal defect (ASD) and 1 patient (2.1%) had ventricular septal defect (VSD). (Table I) Mean maternal age was 25.40±4.46 years. The majority of patients (65%) were from middle class and highest number of patients 27 (56.3%) belonged to nulliparous group. Seven patients (14.58%) had surgical correction prior to pregnancy. 35 (72.9%) patients were in NYHA class I, 12(25%) had in class II and 1(2.1%) had in class III. (Table II)

Maternal complications included pregnancy induced hypertension in 1(2.1%). Placental praevia 02(4.16%) cardiac complications were observed in 4 patients 8.3% had heart failure 3(6.25%) had pulmonary hypertension. There were 1(2.1%) maternal death which included in patients with NYHA class III. (Table III)

Pulmonary hypertension 3(6.25) patients were diagnosed by echocardiography and patients clinically asymptomatic (Table IV).

Intrauterine death occurred in 1(2.1%) baby (Table V).

Gestational age at the time of delivery less than 37 wks 18(37.5%) and more than 37 wks 30(62.5%). Twenty eight patients (58.3%) went into spontaneous labour. Labour was induced in 15 patients (31.25%) with oxytocin. Thirty one patients (64.5%) had normal vaginal delivery, 07 patients (14.5%) had ventouse 03 patients (6.25%) had forceps deliveries caesarean sections was done in 7 patients (14.5%), indications being previous caesarean section, placenta praevia, foetal distress, IUGR.

Mean birth weight was 2.54 ± 0.22 kg. Seventeen babies (35.4%) were low birth weight (LBW). Forty six (95.8%) babies had apgar score of 7/10 at 5 minutes and no neonatal death. 15 (31.25%) patients were induction done at term pregnancy and outcome of induction 100% success (Table VI)

Table I : Distribution of heart disease of the patients (n=48)

Types of heart disease	Number	Percentage
Acquired Rheumatic origin		
Valvular heart disease	43	89.7%
Mitral stenosis	24	50%
Mitral stenosis with regurgitation	15	31.3%
Mitral regurgitation	02	4.2%
Aortic stenosis	01	2.1%
Aortic regurgitation	01	2.1%
Congenital	05	10.4%
Atrial septal defect	04	8.3%
Ventricular septal defect	01	2.1%

Table II : Cardiac Status and maternal Characteristics

Maternal Characteristics	Number %
1. Maternal age (Years)	25.40 \pm 4.46 years
2. Nulliparous	56.3%
3. Multiparous	43.7%
4. Surgical correction	7(14.58%)
5. NYHA classification	
I	35 (72.9%)
II	12(25%)
III	01(2.1%)
IV	0

Table III : Maternal Complications

Maternal Complications	Number
1. Non cardiac	
PIH	1(2.1%)
Placenta Praevia	2(4.16%)
PPH	0
Wound infection	0
2. Cardiac	
Heart failure	4(8.3%)
Pulmonary Hypertension	3(6.25%)
3. Maternal Death	1(2.1%)

Table IV : Onset of heart failure & pulmonary HTN

Time of onset	Number of patient	Percentage
Heart failure		
32 weeks pregnancy	2	4.16%
Puerperium	2	4.16%
Pulmonary hypertension		
38-39 wks pregnancy	3	6.25%

Table V : Maternal death and cause of death

Death	Number of patients	Percentage
Yes	1	2.1%
No	47	97.9%
Cause of death		
Heart failure	1	2.1%

Table VI : Gestational age, mode of delivery & fetal outcome

Gestational age <37wks	18(37.5%)
> 37wks	30(62.5%)
Spontaneous labour	28(58.3%)
Induced labour	15(31.25%)
Vaginal delivery	41(85.42%)
Caesarean section	7(14.58%)
Birth weight (Kg)	
Mean	2.54 \pm 0.22 kg
LBW < 2500 grm	17(35.4%)
Normal 2500 grm	31(64.6%)
Still birth /Intrauterine fetal death	01(2.1%)
Congenital heart disease baby	0
Apgar score at 5min	
7/10	46(95.8%)
<7/10	02(4.2%)
Admitted to NICU	0
Neonatal Death	0

Discussion

Cardiac disease is an important cause of nonobstetric mortality during pregnancy & can result in significant morbidity¹¹. But with optimum management more than 75% of the woman can have a normal pregnancy without complication.

During the present study period (July 2005 to Dec 2006) the total admission of Obstetric patients in the department of Obstetric and Gynaecology in the Chittagong Medical College Hospital were 17398 and 69 cases were found with heart disease. The prevalence incidence of heart disease in pregnant woman was found 0.39%.

Acquired rheumatic valvular heart disease was found to be the most common type of cardiac disease in pregnant woman which accounts 89.7% followed by congenital heart disease which was 10.4%. Among the valvular lesion, mitral stenosis was the most common, 24 (50%) out of 48 patients. Atrial septal defect was the most common type of congenital heart disease 4 (8.13%) out of 48 patients.

A study showed the incidence of heart disease in pregnant woman was 0.4%, majority had rheumatic valvular heart disease (67.3%). Atrial septal defect was the most common congenital heart disease (23.1%)¹⁴.

Another study showed mean age 27.5±5.17 years, congenital heart disease was present in 7(16.7%), 76.2% achieved spontaneous vertex delivery, 16(38.1%) asymptomatic(class-I), 3(7.1%) class IV,3(7.1%) maternal mortalities occurred. Regarding fetal outcome 6(14.3%) infants has IUGR, 2(4.8%) perinatal deaths occurred due to prematurity¹⁵.

A study showed out of fifty, showed caesarean section carried out in 90% which is not consistent with our result, nine patients developed heart failure during the hospital stay, 2(4%) patients were expired, congenital heart disease (n-13,26%), 40(80%) asymptomatic(class-I), 7(14%) class-II, 3(6%) class-III. In this study, 4(8.3%) had heart failure and 1(2.1%) patient expired due to heart failure¹⁶.

A study showed the incidence of valvular heart disease in pregnant woman was 0.4% & majority had rheumatic heart disease (70%) & most of the rheumatic heart lesion was mitral stenosis (60%) & atrial septal defect was the most common type of congenital heart disease¹⁷.

Another study showed that rheumatic valvular disease was 68.5% & mitral stenosis was the most common rheumatic valvular lesion & congenital heart disease was 31.5% where atrial septal defect was predominant. Therefore the findings of the present study almost coincide to previous studies¹⁸. In this study 7 (14.6%) patients had previous cardiac surgery and said study showed that 27% patients had surgically corrected lesion & showed 26.9% patients had their lesion corrected^{14,18}.

The present study showed the mean (± SD) maternal age was 25.40 ± 4.6, range (19-36years), 39(81.3%) patients was in the range of 20-30 years, nulliparous was 27.9%, Gestational age was < 37 wks in 18(37.5%) patients and > 37 weeks in 30 (62.5%) patients. In NYHA grading, 35(72.9%) patients were in G:I. A study found mean (± SD) maternal age was 25±4 years, parity 0.7± 0.8 & 85.4% in NYHA G: I. & primigravida was 53%¹⁸.

In the study the mean maternal age was 24.1 ± 3.4 years, parity 0.52±0.92 & 65.4% patients were in NYHA G:I & primigravida was 51.9%. So the result of the present study is consistent with other study¹⁴.

Normal vaginal delivery was the most common type of mode of delivery which accounts 31 (64.5%) cases, ventouse were applied in 7 (14.5%) cases & caesarean section needed in same 07 (14.5%) numbers. Forceps were applied in 3 (6.25%) cases.

A study showed, the mode of delivery was vaginal in 92% cases & 8% had LSCS²⁰. In the study vaginal delivery was in 40(76.9%) cases, caesarean section carried out in 22% cases¹⁴. The present study showed some difference in the mode of delivery where ventouse required in 7 (14.5%) patients & Forceps were applied in 3 (6.25%) cases. The study showed that 37 (71.15%) babies were term live birth, 13(25%) were preterm live birth, mean birth weight was 2.67± 0.21kg¹⁴. These values are consistent with present study. Another study reported higher incidence of preterm birth in patients with valvular heart disease¹⁹.

Conclusion

The present study showed very few percent of maternal mortality & excellent foetal outcome in a pregnant woman with heart disease. Though the study population are small, the previous studies carried out in our country also supports the present result. Advances in paediatric cardiology and cardiac surgery in our country are resulting in a growing population of young women with congenital heart disease well enough to contemplate pregnancy. Although certain conditions are still associated with a high maternal mortality, it is important to remember that inappropriate advice against pregnancy for a minor lesion can also be devastating to quality of life. The challenge to the cardiologist, obstetrician, and anesthetist working as a team is to present the most realistic and comprehensible estimate of risk, both fetal and maternal and then to achieve the best possible outcome of the patient's decision.

Disclosure

All the authors declared no competing interests

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