

Study of Maternal and Fetal Outcome in Pregnancy with Heart Disease

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ABSTRACT

Background: Heart disease complicating pregnancy is an important indirect cause of maternal mortality and morbidity. Maternal heart disease comprises .2%-2% of pregnancies and responsible for 10%-20% of maternal deaths¹. Our study was done to evaluate fetomaternal outcomes in pregnancy with heart disease.

Objectives: Evaluation of fetomaternal outcome in pregnant patients with cardiac disease. Materials and

Methods: This observational study was done in Bangabandhu Sheikh Mujib Medical University and Anwer Khan Modern Medical College Hospital among 51 pregnant women with known or newly diagnosed heart disease from January 2013-january 2015. Baseline data recorded demographic character, NYHA functional class, maternal complications, mode of delivery and neonatal outcome.

Results: Among 51 cardiac patients, 32 (63%) were primigravida. Mostly 46 (90.6%) belonging to NYHA Class I and II. Rheumatic heart disease seen in 45 (87%) and congenital heart disease in 10% subjects. Mitral stenosis was the most common, seen in 22 (41%) cases. 47.33% patients were delivered vaginally and LSCS done in 41% patients. The fetal outcome were live births in (96.6%) cases, (27.4%) babies required NICU admission.

Conclusion: An improvement in modern techniques of monitoring, better understanding of pathophysiology of cardiac disease and multi disciplinary care can lead to substantial improvement in the fetomaternal outcome.

Key Words: Pregnancy, Cardiac disease, RHD, NYHA Classification

Introduction

Pregnancy makes a significant demand on the cardiovascular system. Cardiac disease in the pregnant woman can present a challenge to the obstetrician, cardiologist and neonatologist¹. The spectrum of cardiovascular disease is changing and varies between countries². At present 0.2 - 2% of all pregnancies are complicated by cardiovascular disease³. Cardiac disorders contribute to approximately 20.5% of maternal deaths⁴. The ratio

of RHD and CHD is decreasing due to improved pediatric care and improved surgical interventions early in childhood. Increasing number of women with cardiac disease is reaching the reproductive age due to modern therapeutic options and moreover these patients are now attempting pregnancy multiple times due to improved availability of life saving modern therapy⁷. Maternal functional status is a most important predictor of outcome and most

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often defined by NYHA functional class⁶. Poor functional status and cyanosis are mostly associated with adverse maternal and neonatal outcome⁷. In developing countries, anemia is a major associated factor that precipitates heart failure. Pregnant women with cardiac disease fall into two categories. Those with diagnosed heart disease and under treatment even before becoming pregnant. Those with previously undiagnosed heart disease. Cardiac lesions and pregnancy both may affect each other adversely. It is essential to thoroughly evaluate patients for underlying cardiovascular disease in order to promote optimal care during pregnancy that plays a major role in the outcome⁸.

Joint care of obstetrician, cardiologist anesthetist and neonatologist, avoidance of complications that add to the burden on the heart and compliance of the patient and her family to regular follow up will go a long way in ensuring a safe outcome for mother and fetus.

Materials and Methods

This Observational study was done in Bangabandhu Sheikh Mujib Medical University and Anwer Khan Modern Hospital among 51 pregnant women with known or newly diagnosed heart disease from January 2013-january 2015. The diagnosis was confirmed by relevant investigations like ECG, Echocardiography, if Chest X-ray needed then abdominal shield was used. These included booked antenatal cases and unbooked emergency cases. The patients were regularly seen at the antenatal clinic and were also seen regularly by cardiologist. The data were obtained from review of medical records. Baseline data recorded including age, parity, gestational age, type of lesion, duration of disease, time of diagnosis, treatment history, New York heart association (NYHA) functional class, maternal complications, mode of delivery and indication of caesarean section, neonatal outcome recorded in term of APGAR score at 1 and 5 minutes, birth weight, maturity (>37weeks) and admission to NICU were noted. In case of maternal mortality the cause of death was noted. Patients were assessed for the mode of delivery those without any contraindications were allowed spontaneous vaginal

delivery while others had cesarean section. Fluid overload and ergometrine were avoided. Prophylactic antibiotic was given to patients. Low molecular weight heparin (LMWH) was given to those with prosthetic valve replacement. Digoxin and diuretics were given in some patients. Patients were kept under strict follow up for at least 48 hours post operative period. A search was made for symptoms and signs of infections anywhere in the body, such as chest, urinary tract and cervico vaginal infections and if found, these were vigorously treated. Patients were advised on the importance of taking adequate rest. They were given Iron and Folate supplements and discharged after 10 days with proper postnatal advice.

Results

Among 51 cardiac patients 38 (74.5%) were of 20-30 years of age, 32 (62.7%) were primigravida. 80.39% patients were in regular antenatal care and 62.7% were diagnosed as cardiac patient before pregnancy and 37.3% were diagnose after pregnancy. 62.7% patients residence from rural area and 37.3% from urban area. 90.2% were house wife and 9.8% were service holder. 54.09% patients completed their primary education and 25.49% passed secondary education or more. Rheumatic heart disease seen in 44 (86.3%) and congenital heart disease in 9.8% subjects. 2 patients (3.9%) suffered from peripartum cardiomyopathy. Among RHD Mitral stenosis was the most common, seen in 21 (41.2%) cases. Mitral regurgitation in 9.8% cases, mitral stenosis and regurgitation in 17.6% patients and mitral regurgitation and aortic regurgitation in 11.8% cases. In congenital heart disease most common lesions was ASD (5.9%). Common presentations of the patients were breathlessness (41.2%) and palpitation (27.5%), others symptoms included cough (13.7%), generalized weakness (11.8%), leg edema (5.9%). Mostly 45 (88.2%) belonging to New York Heart Association (NYHA) Class I and II, 9.8% were in class III and 2% were in class IV. Common maternal obstetrical complications were anemia (47.1%) and preeclampsia (21.6%) and others were hypothyroidism (5.9%), placenta previa (3.9%), breech (2%) twin pregnancy (2%) APH (2%), PPH

in 3.9% patients. Regarding cardiac complications, congestive cardiac failure complicated (17.9%) case, atrial fibrillation in 3.9% cases, pulmonary edema 5.9% case and pulmonary atrial hypertension in 2% cases. Among them 86.3% were more than 37 weeks gestational ages at the time of delivery. 47.1% patients were delivered vaginally and LSCS done in 41.2% patients, 5.9% patients delivered by forceps, 3.9% delivered by ventouse and assisted breech was done in 2% cases. Overall maternal outcome showed 76.5% patients were discharged with advised, 9.8% needed CCU, 5.9% were referred to ICU and maternal mortality was in 2 cases. The fetal outcomes among them were live births in (98%) cases, (25.5%) babies required NICU admission and Perinatal mortality was 2 cases.

Table 1: Demographic Character of patient

Parameter	Number (51)	Percentage (%)
Age		
<20	9	17.6%
20-30	38	74.5%
>30	4	7.8%
Gravida		
Primi	32	62.7%
Gravida 2	13	25.6%
Gravida 3 or more	6	11.8%
ANC		
Regular	17	33.3%
Irregular	24	47.1%
No	10	19.6%
Time of Diagnosis		
Before pregnancy	32	62.7%
After Pregnancy	19	37.3%
Gestational age at deliver		
Term	44	86.3%
Preterm	7	13.7%
Occupation		
House wife	46	90.2%
Service Holder	5	9.8%
Residence		
Urban	19	37.3%
Rural	32	62.7%

Table 2: Types of heart disease among study population

Parameter	Number (51)	Percentage (%)
Rhematic Heart Disease	44	86.3
Mitral stenosis	21	41.2
Mitral Regurgitation	5	9.8
Mitral Stenosis +Mitral Regurgitation	9	17.6
Aortic Stenosis +Aortic Regurgitation	2	3.9
Mitral Regurgitation+Aortic Regurgitation	6	11.8
Mitral stenosis+Tricuspid regurgitation+ Pulmonary Regurgitation	2	3.9
Mitral stenosis+Pulmonary Hypertension	1	2.0
Congenital	5	9.8
ASD	3	5.9
VSD	1	2.0
MVP	1	2.0
Peripartum cardiomyopath	2	3.9

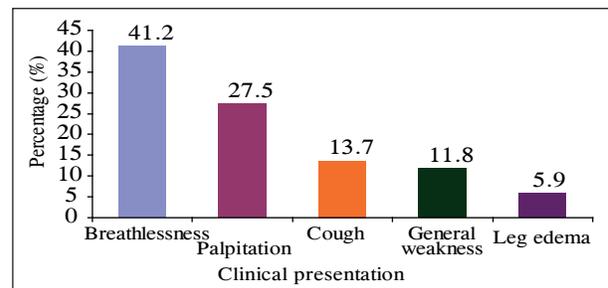


Fig. 1: Clinical presentation of the study patients

Table 3: Functional class of cardiac disease on NYHA classification

Class	Number (51)	Percentage (%)
I	28	54.9
II	17	33.3
III	5	9.8
IV	1	2.0

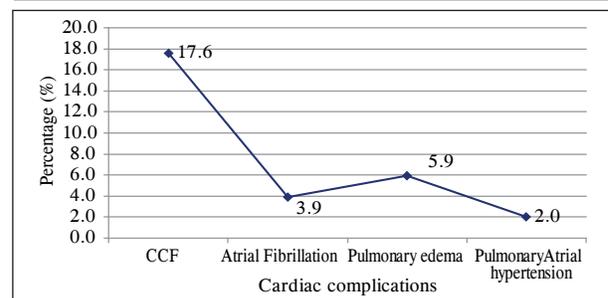


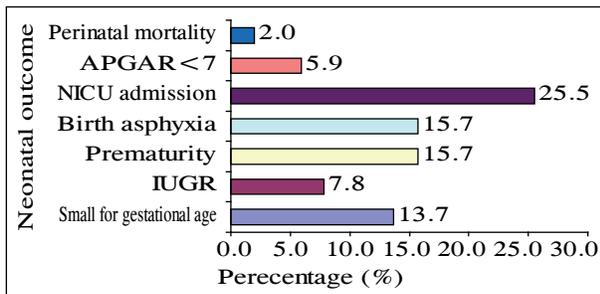
Fig. 2: Cardiac complication of the mother

Table 4: Overall maternal outcome

Outcome	Number (51)	Percentage (%)
Normal Labour	24	47.1
Cesarean Section	21	41.2
Discharge with advised	39	76.5
Referred to CCU	5	9.8
Referred to ICU	3	5.9
Mortality	4	7.8

Table 5: Causative leison of maternal death

Causative leison	Maternal death
MS with AS	1
MS with MR	1
Primary pulmonary Hypertension	2

**Fig. 3:** Neonatal outcome of the study subject

Discussion

In the present study, we determined the type of cardiac lesion and assessed the fetomaternal outcome in pregnant women with cardiac disease. Cardiac disease continues to be a risk factor for maternal and neonatal mortality and morbidity⁹ Most of them were primigravida (62.7%) and (80.39%) were booked cases. The study by Sheela et al, showed similar type of result.¹⁰

Majority of the patients (88.2%) were in NYHA class I and II. Similar findings were seen in other studies^{11,12}. Hsieh et al in their study reported that out of the total fetomaternal deaths 75% were in patients with NYHA class III and IV¹³. In our study, predominant lesion was rheumatic heart disease (86.3%), MS being the most common (41.2%). Similar results were noted in the studies by Mahesh et al (44.6%) and by Nilajkumar et al (55%)^{14,15}. Congenital heart disease accounted for

9.8% of cases, among which ASD was most common (5.9%). Similar results were seen in studies by Sheela et al and Nilajkumar et al¹⁵. In our study, 47.1% women had spontaneous vaginal delivery. The Caesarean section was performed in 41.2% cases mostly for obstetrical indications. The second stage was cut short by instrumentation in 9.8% of patients.

Majority of cases were associated with anemia (47.1%) followed by preeclampsia (21.6%) that worsened the underlying cardiac lesion during pregnancy. Thus, the early diagnosis and treatment of complications as anemia and preeclampsia can improve the outcome. Studies done by various authors have shown similar results^{16,17}.

The cardiac complications were noted in 15 (29.4%) patients out of which 9 (17.6%) developed congestive cardiac failure, 2 developed atrial fibrillation and another 3 had pulmonary edema. Overall maternal outcome showed 76.5% patients were discharged with advised, 9.8% needed CCU, 5.9% were referred to ICU and maternal mortality was in 2 cases. Similar findings were seen in studies done by Mahesh et al^{18,19}.

The small for gestation age was seen in 7 (13.7%) babies. Total 13 (25.5%) babies were admitted to NICU. The perinatal mortality was 2% in our study. The results were comparable to the studies done by Mahesh et al, Hanania et al and Suri et al^{20,21}. Despite the potential for significant maternal morbidity in most patients with cardiac disease, satisfactory outcome can be expected with careful antenatal, intrapartum and postpartum management.

Conclusion

Heart disease in pregnancy has a major impact on pregnancy outcome. Rheumatic heart disease being the prominent cardiac lesion. An improvement in modern techniques of monitoring, better understanding of pathophysiology of cardiac disease and multi disciplinary care can lead to substantial improvement in the fetomaternal outcome and can reduce maternal and fetal mortality and morbidity.

Conflict of interest: We have no conflict of interest.

References

- Burlingame J, Horiuchi B. The contribution of heart disease to pregnancy-related mortality according to the pregnancy mortality surveillance system. *J Perinatal*. 2012; 32: 163-9.
- Surge D, Blake S. Pregnancy complicated by maternal heart disease at the National maternity Hospital, Dublin 1969-1978. *Am J Obst Gyne*. 1981; 139(1): 1-6.
- Barbosa PJ, Lopes AA,. Prognostic factors of rheumatic mitral stenosis during pregnancy and puerperium. *Arq Bras Cardiol*. 2000; 75: 215-24.
- Sawhney H, Aggarwal N, Grover A. Maternal and perinatal outcome in rheumatic heart disease. *Int J Gynaecology Obstet*. 2003; 80: 9-14.
- Cunningham FG, Leveno KJ. Cardiovascular Disease In Williams Obstetrics. 24th edition. McGraw Hill Education; New York; 2010.
- James, Steer, High risk pregnancy management option. In Cardiac disease in pregnancy. 4th edition: 2012; 627-656.
- Bhatla, Yadav, Mishra. The cardiac case. In Ian Donald's practical obstetrics problems. 6th edition. BI Publications Pvt Ltd. India. 2010; 103-126.
- Davies GA, Herbert WN. Assessment and management of cardiac disease in pregnancy. *J Obstet Gynaecol*. 2007; 29(4): 331-6.
- Ohana P, Onaka A, Sauvage LM. The contribution of heart disease to pregnancy-related mortality according to the pregnancy mortality surveillance system. *J Perinatal*. 2012; 32: 163-9.
- Sheela CN, Karanth S, Patil CB. Maternal cardiac complications in women with cardiac disease in pregnancy. *Int. J Pharma Biomed Res*. 2011; 2(4), 261-5.
- Koregeol M, Nina, Nayak R, Amritha. Maternal and perinatal outcomes of pregnancies complicated by cardiac disease. *J Turkish German Gynaecol Assoc*. 2009; 10: 30-4.
- Vasu S, Stergiopoulos K. Valvular heart disease in pregnancy. *Hellenic J Cardiol*. 2009; 50: 498-510.
- Hsieh TT, Chen KC, Soong JH. Outcome of pregnancy in patients with organic heart disease in Taiwan. *Asia Oceania J Obstet Gynaecol* 2007; 19: 21-7
- Bhatla N, Lal S, Behra G, Kriplani A, et al. Cardiac Disease in pregnancy. *Int J Gynaecol Obstet*. 2003; 82: 153-9.
- Kovavisarach E, Nuaplot P. Outcome of pregnancy among parturients complicated with heart disease in Rajavithi hospital. *J Med Assoc Thai*. 2007; 90: 2253
- Surge D, Blake S, Donald D. Pregnancy complicated by maternal heart disease at the National maternity Hospital, Dublin 1969-1978. *Am J Obst Gyne*. 1981; 139(1): 1-6.
- Barbosa PJ, Lopes AA, Feitosa GS. Prognostic factors of rheumatic mitral stenosis during pregnancy and puerperium. *Arq Bras Cardiol*. 2000; 75: 215-24.
- Sawhney H, Aggarwal N, Suri V. Maternal and perinatal outcome in rheumatic heart disease. *Int J Gynaecology Obstet*. 2003; 80: 9-14.
- Sheela CN, Karanth S, Patil CB. Maternal cardiac complications in women with cardiac disease in pregnancy. *Int. J Pharma Biomed Res*. 2011; 2(4), 261-5.
- Koregeol M, Nina, Nayak R, Amritha. Maternal and perinatal outcomes of pregnancies complicated by cardiac disease. *J Turkish German Gynaecol Assoc*. 2009; 10: 30-4.
- Vasu S, Stergiopoulos K. Valvular heart disease in pregnancy. *Hellenic J Cardiol*. 2009; 50: 498-510.