DOI: 10.14260/jemds/2014/2909

ORIGINAL ARTICLE

CLINICAL STUDY OF HEART DISEASE COMPLICATING PREGNANCY

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HOW TO CITE THIS ARTICLE:
Richa Garg, Anuja Bhale Rao, Krutika Bhale Rao. "Clinical Study of Heart Disease Complicating Pregnancy". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 27, July 07; Page: 7398-7405, DOI: 10.14260/jemds/2014/2909

ABSTRACT: Introduction-Heart disease complicating pregnancy is considered as a high risk situation. Increased cardiac demands during the course of pregnancy potentially increase morbidity and mortality in women with underlying heart disease. **AIM:** To determine maternal and fetal outcome in women with heart disease complicating pregnancy, To emphasize on proper protocol for managing pregnancy complicated by heart disease**,** To correlate the time of booking & NYHA grading with maternal & fetal outcome. Risk of adverse outcome is more in rural population as compared to its urban counterpart. **METHOD:** A prospective clinical study of 25 cases of pregnancy complicated by heart disease, reporting to tertiary care hospital for delivery, was carried out to find out the incidence and maternal and fetal outcome. **RESULTS:** The incidence of heart disease in pregnancy in the present study was 0.6%. Most of the women (91%) belonged to low socioeconomic class in the rural population. Rheumatic heart lesions constituted 77% of the cases. Mitral stenosis was the commonest lesion in 40% of cases. Ten (40%) women delivered spontaneously vaginally at term. Cesarean section was performed in 14 cases (56%). There were 5 maternal deaths. There were no perinatal deaths. **CONCLUSION:** Early diagnosis of heart disease, regular antenatal check-up, institutional delivery, limiting family size can reduce the maternal and perinatal mortality and morbidity associated with heart disease.

KEYWORDS: Heart disease in pregnancy, Rheumatic heart disease, Maternal mortality.

INTRODUCTION: Hemodynamic changes during normal pregnancy are well tolerated by women with normal cardiac reserve. Diseased heart shows signs of de compensation with resultant increase in morbidity and mortality. Fetal health depends upon an adequate and continuous supply of well-oxygenated maternal blood. In uncompensated heart disease, the oxygen supply becomes limited and that result in compromised fetal growth, there can be growth restriction, premature birth or may even fetal death.

Rheumatic heart still remains commonest etiological factor for heart disease complicating pregnancy. It is because of frequent and repeated streptococcal infections in childhood especially in rural areas with poor sanitary conditions. In many pregnant women, heart disease still remains undiagnosed until complications develop. Even after the diagnosis, many women do not comply with the instructions given by obstetrician for various reasons. Women having additional obstetrical complications further worsen the prognosis.

In western countries, maternal heart disease complicates1-3% of pregnancies and is the third common cause of maternal death during pregnancy.[1,2] Heart disease is one of the 3 major indirect causes of maternal mortality in India. Most data concerning pregnancy course in heart disease patients are anecdotal reports or are in small series; only a few comprehensive studies are available.[4-9]

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Approximately 1% of pregnancies are complicated by cardiac disease, and the management of these cases can challenge the entire team providing care to the mother and fetus. Cardiomyopathy (predominantly peripartum), myocardial infarction and aneurysm or dissection of the thoracic aorta are the leading causes of death from acquired cardiac disease while pulmonary hypertension is the leading cause of death from congenital heart disease.

Congenital heart disease is the predominant form of heart disease encountered in pregnancy. Due to the successes in pediatric cardiology and cardiac surgery, most patients born with congenital heart disease now survive into adulthood. Therefore, most women with congenital heart disease will reach child-bearing age and may consider pregnancy. It is, therefore, vital that every woman with congenital heart disease should receive preconception counseling as many may be able to have a successful pregnancy, while pregnancy poses an unacceptable risk for others.

There is diversity and broad morphological and functional variability of heart disease therefore management of heart disease during pregnancy is a challenge.

AIMS AND OBJECTIVES:

1. To determine maternal and fetal outcome in women with heart disease complicating pregnancy.
2. To emphasise on proper protocol for managing pregnancy complicated by heart disease.
3. To correlate the time of booking and NYHA grading with maternal and fetal outcome.

MATERIAL AND METHODS: This retrospective study was carried out for a period of 2 years from 1/6/2011 to 30/6/2013 at the Department of Obstetrics & Gynecology, NKPSIMS and Lata Mangeshkar Hospital which is a tertiary care rural based medical college and hospital.

All antenatal women diagnosed to be having heart disease were enrolled in the study. Cases were referred to medical specialist for confirmation of cardiac disease and to seek their opinion regarding management. Cases directly reporting to labor room were also included in the study. Detailed history in regard to cardiac lesion was asked. Detailed obstetric history was also gathered to know the effect of cardiac disease on pregnancy and vice versa.

Thorough clinical examination was done to find out the type of cardiac lesion, any signs of failure and stage of pregnancy. The case was then investigated with specific investigations to confirm the cardiac lesion and the cardiac functional status. Cases were graded as per NYHA classification of grade of heart disease. Patients were advised to have regular antenatal check-up. They were told about the importance of rest, medication and regular visits.

In every visit, patients were referred to physician for their opinion regarding cardiac status. Patients were told to have compulsory institutional delivery. Cases reporting during labor were managed as per the cardiac conditions. Patients were kept for 8-10 days after normal delivery and were discharged with advice about contraception, breast feeding and penicillin prophylaxis.

Outcome measures like demographic data(including age, socioeconomic status), history of presenting symptoms, booking status, parity, type of heart disease, NYHA grading of patient, any history of prior correction, treatment which patient has received, any associated maternal and perinatal complications were analyzed.

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OBSERVATION: Over a period of 2years total number of deliveries were 4, 004.There were 25 diagnosed cases of heart disease complicating pregnancy giving the prevalence of 0.6%.

Age in years	No. of cases(n=25)	%
<20	2	8
20-24	14	56
25-30	7	28
>30	2	8

Table 1: Showing the Age distribution

The mean age observed in this study was 24 years. Youngest was 18yrs & eldest was 33yrs of age.

Parity	No. of cases (n=25)	%
Nulliparous	15	60
Primiparous	9	36
Multiparous	1	4

Table 2: Showing the distribution according to parity

Heart disease	No. of cases (n=25)	%
RHD	15	60
Congenital heart disease	2	8
MVP	2	8
Peripartum cardiomyopathy	5	20
HOCM	1	4

Table 3: Showing the distribution according to Heart lesion

Most common lesion observed in this study was rheumatic heart disease. It was univalvular or multivalvular. A couple of cases of congenital heart disease were found in which one case was associated with eissenmengerisation. Peripartum cardiomyopathy which is considered a rare disease was found to be 20% in this study.

NYHA grade	No. of cases (n=25)	%
I	12	48
II	9	36
III	3	12
IV	1	4

Table 4: Showing the distribution according to NYHA grading

All the cases were graded according to NYHA grading at the time of booking and most cases came below grade I and II.

Period of gestation	No. of cases (n=25)	%
First	6	24
Second	10	40
Third	9	36

Table 5: Showing the distribution according to period of gestation

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Mode of delivery	No. of cases (n=25)	%
Vaginal	10	40
LSCS	14	56
MTP	1	4

Table 6: Showing the distribution according to mode of delivery

Labor was spontaneous in all cases. Caesarian section was done only for obstetric indication. There was no instrumental delivery. Termination of pregnancy was opted in 1 case. The high rate of 56% of cesarean sections was related to the peculiarity inherent in pregnancy in patients with severe heart disease, associated with retardation of fetal growth, fetal distress, and labor induction risks. In heart disease situations, in which cesarean section was indicated, the aim was to improve the maternal and fetal prognosis in those very dangerous clinical settings by reducing the gestational period. In this event, the procedure must be carried out as soon as fetal maturity was established

Complication	No. of cases (n=25)	%
Pulmonary edema	6	24
Atrial fibrillation	2	8
Eissenmenger's	1	4
Death	5	20
Thromboembolism	2	8
Cardiac failure	8	32

Table 7: Showing the distribution according to maternal complications

Mostly cardiac complications were seen. Cardiac failure and Pulmonary edema being the highest. Mortality was seen in 20%.36% admitted in medical ICU.

Non cardiac complications

Complication	No. of cases (n=25)	%
Preterm	9	36
Pre-eclampsia	5	20
Anemia	3	12
PROM	1	4
Oligohydramnios	1	4
Malpresentation	2	8
Fever	2	8

Table 8

Heart disease was observed to be associated with pre eclampsia and anemia in most cases. Mortality was seen in 5 cases which were mostly contributed by peripartum cardiomyopathy. There were no perinatal deaths.

DISCUSSION: The number of women with heart disease, who reach childbearing age in a good functional state has increased due to the improved facilities for diagnosis and treatment. As a result, pregnancy becomes a realistic option for many of these young women. There were total 4004

confinements during 2 years out of which 25 were heart disease cases. Thus, the incidence of heart disease in pregnancy in our study is 0.6%. Most of the patients (91%) belonged to low socioeconomic class in the rural population.

The commonest age group to which the patient belonged to was 20 to 24 years. The majority of the patients (60%) were either primigravidae or primipara. In our study, the number of booked cases was higher than the unbooked cases. 63% were booked and 37 % were unbooked. Rheumatic heart lesions constituted 60% of the cases. The incidence of RHD is higher, as most of the patients belonged to low socioeconomic class where poverty, poor nutrition, low level of sanitation and hygiene and inaccessibility to health services are common.

Mitral stenosis is the commonest heart lesion in 40% of the lesion. Most patients (48%) belong to Grade I functional heart disease and 36% of the cases belong to Grade II heart disease. There were 3 cases with a history of mitral valvotomy done 1 year before conception. They were admitted at 35wks and kept under observation. They stood the pregnancy very well and delivered spontaneously at term without any complications. The puerperium was also uneventful. The commonest complaint in the patients was dyspnea on exertion (57%) followed by palpitation. There were 8 cases of cardiac failure.

Cardiac failure occurred most commonly between 28 to 36 weeks of gestation. Only one patient developed failure during puerperium. 10 patients (62.8%) delivered spontaneously per vaginum. Labour was spontaneous in all cases. Caesarian section was done only for obstetric indication. There was no instrumental delivery. Termination of pregnancy was opted in 1 case. The high rate of 56% of cesarean sections was related to the peculiarity inherent in pregnancy in patients with severe heart disease, associated with retardation of fetal growth, fetal distress, and labor induction risks.

In heart disease situations, in which cesarean section was indicated, the aim was to improve the maternal and fetal prognosis in those very dangerous clinical settings by reducing the gestational period. In this event, the procedure must be carried out as soon as fetal maturity was established. There were 20% cases of peripartum cardiomyopathy that were shifted to ICU but succumbed, thus there were 5 maternal deaths. The perinatal mortality was nil. Accurate assessment of the individual maternal and fetal risk in pregnant women with heart disease is of fundamental importance for optimal patient care.

Despite the diversity and broad morphological and functional variability of heart diseases, few predictors for complications during pregnancy have been recently described. 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.[6]

In the clinical setting, this classification proved to be basically useful and enabled reliable assessment not only of maternal but also of fetal/neonatal risk. Review of the literature indicates that mortality among minimally symptomatic pregnant women with cardiac disease is about 1%: i.e., within the range of the incidence among the healthy general population.[10, 11]

In contrast, pregnant women with severe symptoms have been reported to experience a mortality risk up to 5-15%.[12]

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Women who reach reproductive age in good functional state have pregnancy a realistic option. It was seen that women who were booked at earlier gestational age had better outcome in this study. Most women who sought for clinical help the compromise had already begun.

We found that RHD is still the most common heart disease In this study we found that incidence of peripartum cardiomyopathy which is a rare disease was 20% and most of the patients who went for mortality were of peripartum cardiomyopathy. Cardiomyopathy had complication and mortality rates of 30 and 20%, respectively; this underscores the harmful maternal prognosis specifically associated with left ventricular dysfunction.[13]

It is a disease diagnosed in last trimester of pregnancy when patient complaints of breathlessness and on 2DECHO ejection fraction of <40% is seen without any associated heart disease. Incidence is around 1:1374. It is idiopathic, exact pathogenesis is not known. Most patient presents with heart failure secondary to LV systolic dysfunction. The most important differential diagnosis is pulmonary embolism. This entity is mostly associated with severe pre eclampsia & anemia. Treatment is in form of beta blockers, diuretics, and digoxin.

Study	RHD	CHD	Peripartum cardiomyopathy	Maternal mortality	Perinatal mortality
C.N sheela[14]	67%	26%	5%	25%	20%
Doshi et al[15]	68%	21.5%	5%	17%	
Bhatla et al[16]	88%	11.5%		29.9%	
Abdul hady et al[8]	89.5%			11.4%	1.16%
Madazli 2009[7]	87.5%	12.5%		11.1%	
Avila 2003[4]	55.7%	19.1%		23.5%	2.7%
Present study 2013	60%	8%	20%	20%	0%

Table 9

The most common & serious complications of heart disease in pregnancy were cardiac failure, mortality, prematurity & low birth weight babies.

CONCLUSION: RHD is the most common heart disease in pregnancy. Feto maternal mortality and morbidity is high in NYHA grade III & IV. Heart disease complicating pregnancy is a high risk situation and demands special attention throughout pregnancy, so early booking prevents and decreases the maternal and fetal morbidity and mortality.

An expert supervision and management by the obstetrician along with physician and the fullest co-operation by the patient throughout antenatal, intranatal and post-natal period, results in achieving the optimum maternal and perinatal outcome. It is essential to educate the rural population about the importance of regular antenatal visits and institutional delivery.

Establishing the facilities for cardiac surgery at affordable cost in rural area will certainly go a long way in decreasing the mortality, morbidity related to heart disease complicating pregnancy.

There is a need to increase awareness about peripartum cardiomyopathy. This study reinforces the importance of alert signs (Siu et al) for prognosis of pregnancy which are presence of cyanosis, NYHA class, low LVEF.

A team approach involving obstetricians and cardiologists should be taken ensuring that the patient has been appropriately investigated and is in optimal condition for and well informed about the planned pregnancy. For patients with congenital heart disease, genetic counseling, either before or early in pregnancy, is recommended to identify the risk for their offspring. Predictors for poor maternal and fetal outcome should be identified

Previously, the high maternal mortality in cardiac patients who became pregnant prompted the assertion: Women with an abnormal heart should not become pregnant. This long-standing notion needs to be revised today.

REFERENCES:

1. Arafeh JM, Baird SM. Cardiac disease in pregnancy. Crit Care Nurs Q 2006; 29: 32-52. Medline
2. Dobbenga-Rhodes YA, Prive AM. Assessment and evaluation of the woman with cardiac disease during pregnancy. J Perinat Neonatal Nurs 2006;20:295-302.MedlineWeb of Science.
3. Stangl V, Baumann G, Stangl K. Pregnancy risks in acquired heart diseases. Z Kardiol 2001;90:16-29. CrossRef.
4. Avila WS, Rossi EG, Ramires JA et al. Pregnancy in patients with heart disease: experience with 1000 cases. Clin Cardiol 2003;26:135-142. CrossRef Medline Web of Science.
5. Siu SC, Sermer M, Harrison DA et al. Risk and predictors for pregnancy-related complications in women with heart disease. Circulation 1997; 96: 2789-2794. Abstract/FREE Full Text.
6. Siu SC, Sermer M, Colman JM et al. Prospective multicenter study of pregnancy outcomes in women with heart disease. Circulation 2001; 104: 515-521. Abstract/FREE Full Text.
7. Siu SC Colman JM, Sorensen S et al. Adverse neonatal and cardiac outcomes are more common in pregnant women with cardiac disease. Circulation 2002; 105: 2179-2184. Abstract/FREE Full Text.
8. Abdel-Hady ES, El-Shamy M, El-Rifai AA et al. Maternal and perinatal outcome of pregnancies complicated by cardiac disease. Int J Gynaecol Obstet 2005;90:21-25.CrossRefMedline
9. Khairy P, Ouyang DW, Fernandes SM et al. Pregnancy outcomes in women with congenital heart disease. Circulation 2006; 113:517-524.
10. Clark SL. Cardiac disease in pregnancy. Crit Care Clin 1991; 7: 777-797. Medline Web of Science.
11. Barbosa PJ, Lopes AA, Feitosa GS et al. Prognostic factors of rheumatic mitral stenosis during pregnancy and puerperium. Arq Bras Cardiol 2000;75:215-224.Medline
12. Sawhney H, Aggarwal N, Suri V et al. Maternal and perinatal outcome in rheumatic heart disease. Int J Gynaecol Obstet 2003; 80:9.
13. Elkayam U, Ostrzega EL, Shotan A. Peripartum cardiomyopathy. In Principles and Practice of Medical Therapy in Pregnancy (Ed. Gleicher N), p. 812–814. Norwalk, Conn.: Appleton & Lange, 199.
14. C.N. Sheela et al. Maternal cardiac complications in women with cardiac disease in pregnancy. Int J Pharm Biomed Res 2011, 2(4), 261-265.
15. Doshi HU, Oza HV, Tekani H, Modi K. Cardiac disease in pregnancy--maternal and perinatal outcome. J Indian Med Assoc. 2010 May; 108(5): 278-80, 282.
16. Bhatla S, Lal G, Behera A, Kriplani S, Mittal N, Agarwal et al. Cardiac disease in pregnancy. Int J Gynaecol Obstet. 82 (2): 153-9. 2003.

DOI: 10.14260/jemds/2014/2909

17. Madazli R, Sal V, Cift T et al. Pregnancy outcomes in women with heart disease. Arch Gynecol Obstet, 2009.

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Date of Submission: 25/04/2014.
Date of Peer Review: 26/04/2014.
Date of Acceptance: 07/05/2014.
Date of Publishing: 02/07/2014.