

CLINICAL PROFILE OF RHEUMATIC HEART DISEASE IN PREGNANCY

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ABSTRACT

Cardiac disease is an important cause of maternal mortality and morbidity both in ante partum and post partum period. Rheumatic heart disease (RHD) is major cause of women with heart disease in developing countries; whereas in developed countries it is the congenital heart disease. The overall incidence of heart disease in pregnancy is around 1%. The aim of this study was to assess clinical features, complications, management, maternal and fetal outcome of pregnant women with rheumatic heart disease. This prospective study was conducted in 50 pregnant females with RHD in Sassoon general hospital, Pune during the period of one and ½ year from Sept 2004 to Dec. 2005. Rheumatic heart disease with isolated mitral stenosis lesion was the commonest acquired lesion in these patients. Congestive cardiac failure and rhythm disturbance were common complications during pregnancy. Preterm deliveries, low birth weight babies, still birth were associated with RHD during pregnancy. However early diagnosis, strict medical vigilance during pregnancy, a team work of obstetrician, physician and cardiologist can improve maternal as well as fetal out come.

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INTRODUCTION

The prevalence of heart disease in pregnancy is found to vary between (0.3 -3.5 %).¹ Cardiac disease in pregnancy is broadly divided into congenital and acquired. The acquired causes are rheumatic heart disease (RHD), cardiomyopathies and ischemic heart disease.² RHD still contributes a major cause of heart disease in developing countries. It is one of the three major indirect causes of maternal mortality in India.³

The hyper dynamic changes during pregnancy increase the workload on heart. It is difficult to compensate these hyper dynamic changes by diseased heart, with resultant increase in maternal mortality and morbidity. It compromises fetal health also as fetal health depends upon adequate and continuous blood supply of well oxygenated maternal blood.⁴ There is 50% increase in plasma volume and six fold increase in the risk of thrombosis during pregnancy, so pregnancy is a challenge to women with heart disease.⁵

A large number of women become pregnant prior of seeking therapeutic intervention for heart disease and most of them are diagnosed only at the time of pregnancy, as it may be the first contact of the women with health care facility.⁶

A multicentric epidemiological study, published in 1996 by Indian council of medical research gave the RHD prevalence as 6/1000 in the age group 5-16 year.⁷ In India, the RHD contributes to approximately 69% of cardiac disorders seen in pregnancy.⁸ The maternal mortality rate is as high as 7% and

morbidity rate higher than 30% during pregnancy with heart disease.⁹

Maternal outcome is determined by the nature of the cardiac disease, surgical repair, myocardial dysfunction, history of arrhythmia and prior cardiac events.¹⁰ Very few studies conducted in India to focus particularly on heart disease in pregnancy. The present study was planned to determine the type of cardiac lesion, its clinical features and to assess the maternal and fetal outcomes in patients with heart disease in pregnancy.

MATERIAL AND METHODS

In this prospective study, 50 pregnant women with rheumatic valvular heart disease from Sassoon general hospital were selected during the period from Sept 2004 to Dec 2005.

Pregnant women with RHD with and without surgical management like valve commissurotomy, Balloon valvotomy, closed mitral valvotomy or prosthetic heart valve replacement were included in this study.

A detailed proforma was predesigned to gather the essential information regarding heart disease in pregnancy .A careful history of patients with past history of rheumatic fever, surgical intervention, medical treatment, cardiac failure in past, detailed obstetric and menstrual history, any complication during pregnancy was also taken. The patients are allotted according to their functional grades i.e. NYHA classification to know the severity of symptoms. A thorough clinical

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examination was made to find out the type of cardiac lesion, any signs of failure or associated complication.

Inclusion criteria

All patients were investigated for routine haemogram, urine microscopy, electrocardiogram, 2 D ECHO with color Doppler. Obstetric ultrasonography, and if required blood culture sensitivity. Placental Doppler to rule out uteroplacental hypoperfusion.

Exclusion criteria

Patients with symptoms of functional heart disease were excluded. Patients with valvular heart disease due to other causes like congenital, syphilitic, ischemic, peripartum cardiomyopathy were excluded from study.

All patients were followed up till delivery and observed for any complication during antepartum, intrapartum and immediate postpartum period. Patients undergone surgical intervention like balloon mitral valvotomy during pregnancy observed during the time of surgery. Mode of delivery, requirement of instrumentation and caesarean section, any complication documented in this study. Fetal outcome recorded in term of prematurity, birth weight and mortality. The data was analysed with statistical software.

RESULTS

In this study 50 pregnant females with rheumatic valvular disease irrespective of their gestation period were included

Table no.1 Age distribution in this study

Sr no.	Age group	No. of patients	Percentage
1	18-23 yrs	28	56%
2	24-29 yrs	16	32%
3	30-35 yrs	3	6%
4	>35 yrs	3	6%

Mean age = 23.7 years Maximum patients were in age group 18-23 years

Table no 2 Distribution of parity in this study

Sr. no.	Gravida	No. of patients	Percentage
1	Primigravida	23	46%
2	2 nd gravida	14	28%
3	3 rd gravida	10	20%
4	multigravida	3	06%

Mean para 1.8 Maximum patients in this study were primigravida and multigravidas are the least.

Table no. 3 Distribution of patients according to NYHA grading and no. of patients developed congestive cardiac failure in this study.

NYHA grade	No. of patients	Percentage	No. of patients in CCF
I	10	20%	-
II	25	50%	4
III	7	14%	5
IV	8	16%	8

Percentage of patients in NYHA grade III and IV were 30%. Patients with NYHA grade III and IV were more prone for CCF as compared to NYHA grade I and II
 $X^2= 25.96$ $p = 0.000$ i.e. significant.

Table no. 4 Distribution of patients undergone surgical interventions

Operative procedure	No. of patients
Closed mitral valvotomy	2
Mitral valve replacement	1
Balloon mitral valvotomy	11

Before pregnancy	2
During pregnancy	9 (6 in 2 nd & 3 in 3 rd trimester)

Out of 50, 14 patients had undergone operative procedure i.e. 28%. Out of 14 patients, 11 had undergone percutaneous balloon mitral valvotomy.

Table no. 5 Distribution of valvular lesions in this study and association with congestive cardiac failure

Valvular lesion	No. of patients	Percentage	No. of patients in CCF
Pure MS	29	58%	11
MS + Mod MR	8	16%	4
Pure MR	7	14%	1
Multivalvular	5	10%	1
Prosthetic valve	1	2%	-

In this study, maximum patient had pure mitral stenosis i.e. 58%. Maximum no. of patients of CCF had pure mitral stenosis. Isolated lesion i.e. either pure MS or MR in total 36 patients i.e. 72%. $X^{=0.47}$ $p=0.4948$ NS

Table no. 6 Correlation of severity of mitral stenosis in patients and occurrence of CCF

No. of pts. Acc. Severity of mitral stenosis	No. of patients in CCF	Percentage
Critical MS MVA < 1 sq. cm. (21)	9	43%
Mod. MS MVA (1.1 – 1.5) sq. cm (8)	2	25%

Out of 29 pure MS patients, 21 patients had critical MS. Out of them 9 patients had developed CCF. Out of 8 patients of moderate MS, 2 patients had developed CCF. $X^2 = 0.76$ $p= 0.384$ NS

Table no. 7 Distribution of patients according to pulmonary hypertension on 2D ECHO and association with CCF

Severity of Pul.HTN	No. of patients	Patient in CCF
Mild (30-45 mmHg)	15	1
Moderate (45 -60 mmHg)	26	10
Severe (> 60 mmHg)	9	6

Patients of severe pulmonary hypertension were found to be more prone for CCF. $X^2 = 5.11$ $p= 0.023$ i.e. significant.

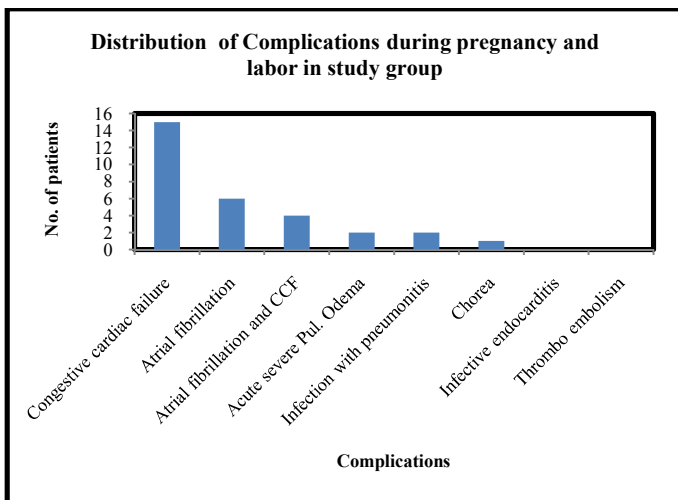
Table no. 8 Distribution of patients according to left atrium size (LA) and association with atrial fibrillation (AF)

Left atrial size	No. of patients	Patients in AF
≤ 45mm	20	1
>45mm	30	9

Mean LA size was 45.58. Patients with LA size > 45mm were more prone for atrial fibrillation.

$X^2= 4.59$ $p=0.0321$ i.e. significant.

Table no. 9 Distribution of complications during pregnancy and labor in study group



CCF and rhythm disturbances were most common complications with RHD and pregnancy.

Table no.10 Distribution of gestational age at the time of delivery

Gestational age	No. of patients
Full term delivery	39
Preterm delivery	5
Postdate delivery	2

Table no. 11 Type of delivery in this study

Type of delivery	No. of patients
Spontaneous vaginal	33
Forceps	11
Cesarean Section	2

Table no 12 Distribution of fetal outcome in this study

	No.	Percentage
Normal weight (> 2.5 kg) baby	32	71.2%
Low birth wt. (< 2.5 kg) baby	Total 13	28.8%
Full term (37-42 wks)	9	
Pre term (< 37 wks)	3	
Post term (>42 wks)	1	
Abortion (MTP 1 + sponta.1)	2	4%
Died	1	2%

About 71% babies had normal weight. Fetal mortality (death + abortion) = 6%

Table no 13 Weight distribution of babies in study group

Weight group	No. of fetus	Percentage
2.0 – 2.200 kg	6	13.3%
2.211 -2.400 kg	7	15.5%
2.401 -2.600kg	11	24.4%
2.601 -2.800kg	14	31.1%
2.801 -3.000 kg	7	15.5%

Mean wt. was 2.518 kg Around 27-28% babies had low birth weight.

Table no 14 Maternal and perinatal outcome in operated and non operated patients

	Non operated	Operated
No. of patients	36 (72%)	14 (28%)
NYHA class III-IV	14 (28%)	1(2%)
Atrial fibrillation	8 (16%)	2 (4%)
CCF & Pulmonary Edema	17 (34%)	0 (0%)
Preterm	3(6%)	2(4%)
Low birth weight	11 (22%)	2(4%)
Maternal death	2(4%)	0(0%)

DISCUSSION

In this study, 50 pregnant women with RHD irrespective of their gestation period were included. They were followed up, investigated for type and severity of cardiac lesion, evaluated for complications till delivery and managed accordingly. Previously diagnosed RHD patients were 31 and newly diagnosed in this pregnancy were 19.

Majority of patients were in the age group (18-30) years (88%) and most of them were primigravida. This was comparable to Bangal VB *et al* study.¹¹

The mitral valve was the most commonly involved. Isolated mitral valve lesion, both pure stenosis and regurgitation accounted for 72% of our subjects. Pure mitral stenosis was the most common cardiac lesion (58%). This was similar to the observation of Sheela *et al*¹² Hemapriya *et al*¹³, Sawhney *et al* studies.¹⁴ Multivalvular cardiac lesions were found in 10% of patients. Only one patient had prosthetic mitral valve replacement prior to pregnancy and she was on anticoagulant prophylaxis throughout the pregnancy till delivery. She was observed for complication like thromboembolism and infective endocarditis. Anticoagulant was stopped before delivery and restarted after it.

The outcome of pregnancy was determined by the maternal functional status according to NYHA grading. In our study 30% patients were in NYHA grade III and IV and they went into cardiac failure complication. Maximum patients with CCF were in 3rd trimester. Two patients (4 %) with poor functional status NYHA IV died, because of acute pulmonary oedema. Sawhney *et al* reported a maternal mortality rate of 2% women with cardiac disease. They studied 486 women with over a period of 13 years. 8 women out of 10 deaths, were in NYHA class III and IV.¹⁴

Our of 29 pure MS patients, 21 had critical MS (mitral valve area < 1 sq cm). Nine patients out of them had developed CCF. Patients of severe pulmonary hypertension were found to be more prone for CCF. (P = 0.023) patients with left atrium size (> 45 mm) were more prone for atrial fibrillation (P = 0.0321). 28% of present patients had undergone operative procedures. Out of them 10% underwent surgery prior to pregnancy. All of them tolerated pregnancy well. 18% patient underwent balloon mitral valvotomy during 2nd and 3rd trimester. Both maternal and fetal complications were documented less in operated patients as compared to patients who had not undergone surgical correction for cardiac lesion.^{15,16}

Congestive cardiac failure (38%) and atrial fibrillation (20%) were most common complications found in this study. Only one patient (2%) had rheumatic chorea during 28 weeks of pregnancy. She was treated with injection haloperidol as period of organogenesis was over. Later on she was shifted to oral sodium valproate with folic acid supplement to prevent recurrence. The complication, like infective endocarditis and thrombo embolism were not observed in this study. In Sawhney *et al* study (0.8%) maternal mortality was because of infective endocarditis and thrombo embolism each.¹⁴

The major risk for an adverse cardiac event occurring was during labor and in the immediate post partum period. Hence delivery was best carried out at a tertiary centre with intensive care facilities and under care of obstetrician, physician and cardiologist.¹¹ Antibiotic prophylaxis against infective endocarditis was recommended.

In present study, 39 patients had full term and 5 patients had preterm delivery. The rate of instrumental delivery was 22% and 66% patients had spontaneous vaginal delivery without assistance. Cesarean section was done in 4 % patients for obstetric indication. The JCS joint working group recommended cesarean section only for patients with cardiac dysfunction, patient at risk of hemodynamic instability, pulmonary hypertension, uncontrolled arrhythmia, mechanical valve prosthesis and patients with cyanosis.¹⁷

In our study, two patients had abortion (4%) and one had still birth (2%). About 28% patients had low birth weight babies (< 2.5 kg). Similar finding were reported in Soma pillay *et al*¹⁸, HemaPriya study¹³. It suggests that maternal cardiac disease itself could be one of the risk factors for low birth weight in babies.

The incidence of rheumatic heart disease has decreased, but it is still an important cause of maternal and perinatal morbidity and mortality. A satisfactory outcome can be expected with careful antenatal, intra partum and post partum management.^{19,20}

CONCLUSION

The rheumatic heart disease continues to contribute to maternal morbidity and adverse perinatal outcome. Proper evaluation of maternal prognosis prior to conception and proper clinical follow up during pregnancy are basic measures for better outcome in these patients. This study concluded that pre pregnancy diagnosis, counseling, appropriate referral, regular antenatal supervision, multidisciplinary management and delivery at well equipped tertiary centre improve both maternal and fetal outcome in patients with heart disease. As cardiac failure is the most serious complication in such patients, we need to monitor these patients for early detection and management of heart failure during pregnancy, labor and post partum period. Early surgical intervention like balloon mitral valvotomy during antenatal period reduces adverse events or maternal complications.

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