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Research Article

Maternal and fetal outcomes in rheumatic heart disease in pregnancy

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ABSTRACT

Background: Rheumatic Heart Disease remains the most common type of heart disease in pregnancy in developing countries. Over a period of 2 years,129 pregnant patients with Rheumatic Heart Disease attending our outpatient department, were observed from admission till discharge and the clinical course during pregnancy and the maternal, foetal outcomes, and desire of future contraception studied.
Methods: Patients were routinely examined every antenatal visit for signs of anemia and congestive cardiac failure. They were usually admitted at 28-32 weeks of gestation unless they presented with symptoms of cardiac failure earlier in pregnancy. Frequency of the antenatal visits depended on the functional cardiac status.
Results: The incidence of heart disease was 0.96% for all deliveries during our study period. The incidence of RHD was 71.6%. 65.1% of women gave a h/o rheumatic fever. 45(34.9%) patients had undergone surgical correction and 84(65.1%) did not undergo surgical correction. 95.3% had moderate to severe disease but only 18.6% were in NYHA class III/IV. Hence severity of disease did not correlate with NHYA class. 76.7% of women had vaginal delivery. LSCS was done for obstetric reasons alone.
Conclusion: The association of the pre pregnancy functional class with the risk of maternal events raises attention to the possibility of reducing these complications in pregnant women with mitral stenosis by means of early interventions aimed at improving their functional class.

Keywords: Rheumatic heart disease, Mitral stenosis, Congestive cardiac failure, Pregnancy

INTRODUCTION

The incidence of heart disease in pregnancy is about 1%.[1,2] Rheumatic Heart Disease is the more common type in developing countries. Rheumatic heart disease results from single or repeated attacks of rheumatic fever that produces rigidity and deformity of valve cusps, fusion of the commissures, or shortening and fusion of the chordae tendinae.[3,4] Stenosis or insufficiency results, and the two often co- exist. Mitral Stenosis is the most common lesion encountered.[3,5] A history of rheumatic fever is obtained only in 60% of patients with rheumatic valve disease. The patients affected belong predominantly to the low socioeconomic stratum. Delivery has become safer in those patients who have undergone surgical correction of the lesions prior to pregnancy.[6,7] However, maternal mobidity and mortality does remain a significant problem in those who have not undergone treatment or are diagnosed with the lesion for the first time during pregnancy.[8,9]

METHODS

This is a descriptive study.

This study was conducted in The Chennai Medical College and Research Institute, Irangalur, Tiruchirapalli, India. One hundred and twenty nine (129) women with rheumatic

heart disease were registered in this study from January 2012 upto December 2013.

Inclusion Criteria

All patients with Rheumatic heart disease (Mitral Stenosis, Mitral Regurgitation, Aortic Regurgitation, Aortic Stenosis: as diagnosed from history, clinical examination and echocardiography) who were

- On long term treatment
- Newly diagnosed
- Surgically operated on
- Desiring medical termination and sterilization were included for the study.

Exclusion Criteria

Patients with

- Mitral valve prolapse with mitral regurgitation
- Isolated aortic stenosis

Methodology

All patients admitted in our institute with rheumatic heart disease were observed from admission till discharge and the clinical course during pregnancy and the maternal, foetal outcomes and awareness and use of contraception studied. Patients were routinely examined every antenatal visit for signs of anemia and congestive cardiac failure. They were usually admitted at 28-32 weeks of gestation unless they presented with symptoms of cardiac failure earlier in pregnancy. Frequency of the antenatal visits depended on the functional cardiac status. Our patients were already under the supervision of cardiologists.

They were advised to have adequate bed rest and take high calorie diet. Anaemia was corrected by oral iron supplementation and urinary tract infection treated with appropriate antibiotics.

Patients in cardiac failure were managed in the intensive care unit.

RESULTS

In this study of 129 pregnant women with RHD:

- The incidence of heart disease was 0.96% for all deliveries during our study period.
- The incidence of RHD was 71.6%
- 65.1% of women gave a h\o rheumatic fever
- 45(34.9%) patients had undergone surgical correction and 84(65.1%) did not undergo surgical correction.
- The most common surgical procedure done was closed mitral commisurotomy (80%).
- The most common valvular lesion was mitral stenosis (48.1%).
- 90.8% of patients belonged to class IV\V socioeconomic status.
- 86.6% of patients were between 21-28 years of age.
- 95.3% had moderate to severe disease but only 18.6% were in NYHA class III/IV. Hence severity of disease did not correlate with NHYA class.
- 76.7% of women had vaginal delivery. LSCS was done for obstetric reasons alone.
- There were more preterm births and low birth weight babies in the not-operated group.
- There was no significant difference in the incidence of CCF between both groups.
- Women with mechanical valves had good maternal and fetal outcomes.
- Only 40.2% of women adopted some form of contraception

Table 1: Incidence of Heart Disease.

Total no of Deliveries	Heart Disease	Incidence
18700	180	0.96%

Table 2: Incidence of Rheumatic Heart Disease.

Heart Disease	Patients with RHD	Percentage
180	129	71.6%

Table 3: Rheumatic Fever and RHD.

Patients with RHD	H\O Rheumatic Fever	Percentage
129	84	65.1%

Table 4: Operated vs Non Operated RHD.

Rheumatic Heart Disease	No of Patients	Percentage
Operated	45	34.9%
Not Operated	84	65.1%
Total	129	100%

Table 5: Type of Surgery for Mitral Valve Lesions.

Rheumatic Heart Disease	Operated	Percentage
Closed Mitral Commisurotomy	36	80%
Balloon Mitral Valvuloplasty	2	4.5%
Mitral Valve Replacement	6	13.5%
Open Mitral Valvotomy	1	2%

Table 6: Type of Lesion.

Type of Lesion	Number	Percentage
Mitral Stenosis	60	46.5%
Mitral Regurgitation	27	20.9%
Combined Mitral Valve Lesions	21	16.3%
Multivalvular Lesions	21	16.3%

There were no lesions of aortic regurgitation.

Table 7: Socio-Economical Status.

Socioeconomic Status	Number	Percentage (%)
Class I	0	0
Class II	2	1.6
Class III	10	7.6
Class IV	41	31.6
Class V	76	59

90.8% of patients belonged to class IV-V socioeconomic class.

Table 8: Age Distribution.

Age	Number	Percentage
< =20 Yrs	4	3.1
21-24 Yrs	76	58.9
25-28 Yrs	36	27.7
>= 30 Yrs	13	10.3

86.6% of patients were between 21-28 years.

The youngest was aged 18 years and the oldest 35 years.

Table 9: Severity of Rheumatic Heart Disease.

Severity (Echo)	Number	Percentage (%)
Mild	6	4.7
Moderate	61	47.3
Severe	62	48

95.3% of patients had moderate to severe disease.

Table 10: NYHA Functional Class.

NYHA Classification	Number	Percentage (%)
I	4	3.1
II	101	78.3
III	18	14
IV	6	4.6

Table 11: Pregnancy Outcome.

Pregnancy Outcome	Number of Patients	Percentage (%)
Labour Naturalis	75	58.1
Outlet Forceps	24	18.6
LSCS Primary Repeat	8 12	6.2 9.3
Spontaneous Abortions	2	1.6
MTP	8	6.2

65.9% of patients had vaginal deliveries of which 15.5% were forceps deliveries; 24.1% of patients had LSCS.

Table 12: Maternal Complication in RHD Operated vs Non Operated.

Complications	Operated		Not Operated	
	No	%	No	%
Preterm	2	1.6	20	15.5
PIH	1	0.8	4	3.1
CCF	6	4.7	18	13.9
Arrhythmia	0	0	1	0.8
Embolism	0	0	1	0.8
Fever	1	0.8	5	3.9
Anemia	5	3.9	13	10.1

Table 13: CCF in Operated vs Non Operated RHD.

	Operated	Not Operated
No of Patients	45	84
CCF	6	18
Percentage	13.3	21.4

$Chi^2=0.76$

P=0.68

The incidence of CCF in the non operated group was 21.4% compared to 13.3% in the not operated group which was not statistically significant.

Table 14: Birth Weight in RHD Operated vs Non Operated.

Birth Weight(Kg)	Operated		Not Operated		Total	
	No	%	No	%	No	%
<=1	0	0	2	1.7	2	1.7
1-1.4	0	0	5	4.2	5	4.2
1.5-2	2	1.7	17	14.5	19	16.2
2.1-2.4	6	5.1	14	11.9	20	16
>=2.5	34	29	36	30.8	70	59.8

38.1% of babies were below 2.5 kg.

Table 15: Low Birth Weight in Operated vs Not Operated RHD.

	Operated	Not Operated
No: of Births	41	76
Birth Wt<2.5 Kg	8	38
Percentage	19.5	50

Chi^2= 4.79

P <0.05

There was 50% of babies weighing less than 2.5 kg in the not operated group as compared to 19.5% in the operated group and the association was found to be statistically significant.

Table 16: Preterm Births in Operated vs Non Operated RHD.

	Operated	Not Operated
No: of Births	41	76
Preterms	2	20
Percentage	4.8	26.3

Chi^2= 5.82

P<0.05

The incidence of preterm births was 26.3% in the not operated group compared to 4.8% in the operated group and the association was found to be statistically significant.

Table 17: Perinatal Complication in RHD Operated vs Non Operated.

Complications	Operated		Not Operated	
	No	%	No	%
IUD	0	0	1	0.8
Still Birth	1	0.8	1	0.8
Sepsis	0	0	4	3.1
Hyperbilirubinemia	0	0	1	0.8
Birth Asphyxia	1	0.8	4	3.1
RDS	0	0	8	6.2

Table 18: Perinatal Mortality in RHD Operated vs Not Operated.

	Operated	Not Operated
No: of Births	41	76
Perinatal Death	1	9
Percentage	2.4	11.8

Chi^2 =5.82

P<0.05

perinatal mortality was 11.8% in the not operated group compared to 2.8% in the operated group which was statistically significant.

Table 19: Maternal Mortality in RHD.

	No of Patients	No of Deaths
No: of Patients	129	4
Percentage	100	6.7%

Table 20: Contraception.

Form of Contraception	No of Patients	Percentage (%)
MTP with Sterilization	8	6.2
LSCS with Sterilization	12	9.3
Puerperal Sterilization	7	5.4
Copper-T	4	3.1
Barrier Methods	15	11.6
Vasectomy	6	4.6

DISCUSSION

The incidence of heart disease was found to be 0.96%. This is comparable with other similar studies.

Mudaliar and Menon,[1] 2005	0.97%
Williams,[2] 2005	1%
Present study 2006	0.96%

About 129 women with rheumatic heart disease were included in this study. Rheumatic heart disease constituted for 71.6% of heart disease in pregnancy. A study by Batla N et al in 2003 showed 88% incidence of RHD.

Batla N[3] 2003	88%
Present study 2006	71.6%

Rheumatic Fever and RHD

In our study 65.1% of patients with RHD gave a h\o prior rheumatic fever.

This is comparable to 60% incidence quoted in CMDT 2007.

CMDT 2007[10]	60%
Present study 2006	65.1%

Socioeconomic Status

Most of these patients belong to socioeconomic status class IV-V(90.8%).

This is comparable to data reported by Nafeesa Beebi et al (92%).

Nafeesa Beebi et al 1985	92%
Present study 2006	90.8%

Type of Lesion

Mitral stenosis has been found to be the dominant lesion in RHD. Sawhney et al showed that mitral stenosis was the most predominant lesion (89.2%) in 486 patients. Batla et al in 2003 had a 34.2% incidence of mitral stenosis in pregnancy. In our study involving 129 patients, 89(69%) had single valve involvement and mitral stenosis was the predominant lesion (48.1%).

Study	Dominant Mitral Stenosis (%)
Shawney et al[5] 2003	89.2%
Batla et al[3] 2003	34.2%
Present study 2006	46.5%

Severity and Functional Class

Reference	Nhya I and II (%)	Nyha III and IV (%)
Shawney et al[5] 2003	77.4	22.6
Batla et al[3] 2003	84.5	15.5
Present study	81.4	18.6

From the above references it is clear that most patients belonged to NHYA I and II. However in our study sixty two(42%) of patients had severe valvular anatomical disease, but only twenty four(18.6%) belonged to NYHA class III and IV. Hence anatomical severity did not correlate with functional class.

Maternal Complications

Batla et al[3] 2003	29.9%
Present study 2006	28.7%

The incidence of maternal complications was comparable between both studies. However there was no significant association (P=0.68) between the incidence of CCF in the operated and the not operated group in our study. This may be because 16\45(35.5%) in the operated group had severe disease due to restenosis.

Preterm

Shawney et al[5] 2003	12%
Present study 2006	18.8%

The incidence of preterm labour was comparible in both studies. However in our study we found a significant association (P<0.05) in incidence of preterm babies in the not- operated (26.3%) vs operated group (4.8%).

Fetal Complications

Batla et al[3] 2003	20.28%
Present study 2006	20.5%

The incidence of fetal complications is comparable in both studies. We found a significant association (P<0.05) in the incidence of low birth weight babies in the operated (50%) vs not-operated (19.5%) group in our study.

Perinatal Mortality

Reference	Perinatal Mortality
Deepak Lahiri et al[11] 1995	5.4%
Present study 2006	8.5%

Perinatal mortality is comparable in the above studies. There was a significant association (P<0.05%) between the operated (11.8%) vs not-operated (2.4%) group in our study.

Maternal Mortality

Shawney et al[5] 2003	2.05%
Silversides CK et al[13] 2003	5-7%
Present study 2006	3.1%

The maternal mortality is comparable in both studies. There were totally 4 maternal deaths: two in the operated group (4.4%) and two in the not-operated group (2.3%). All four patients died due to acute pulmonary edema secondary to CCF with severe mitral stenosis, two of whom were detected during incident pregnancy.

Contraception

Only 40.2% of patients opted for contraception inspite of understanding risks associated with cardiac condition. All patients with valvular heart disease should use contraception in between pregnancies.

It is disturbing that 6.2% of patients underwent MTP with sterilization. All of these patients were multigravidas. We recommend that these patients be encouraged to undergo interval sterilization after the second child.

Pregnancy after Cardiac Surgery

	Butta et al[14] 2003	Present study 2006
No of patients	113	45
Patients with prosthesis	45%	13.5%
CCF	16%	4.7%
Arrhythmia	4%	0%
PPH	3.5%	0%
PIH	2%	0.8%
Thromboembolism	0.6%	0%
Maternal mortality	0%	4.4%
Abortion	10.6%	0%
Still birth	2%	0.8%
Preterm	6.7%	4.8%
Neonatal deaths	0%	2.4%
Foetal malformation due to warfarin	0%	0%

These two studies are comparable in most variables.

According to this study, pregnant women with mitral stenosis still are at relatively high risk of experiencing maternal complications. The results shown are consistent with those reported by other studies.

The association of the pre pregnancy functional class with the risk of maternal events raises attention to the possibility of reducing these complications in pregnant women with mitral stenosis by means of early interventions aimed at improving their functional class.

The mitral valve area was also strongly significantly associated with the risk of maternal events. If the mitral valve area was the only determining risk factor for events in these patients, the correction of high-degree stenosis should correspond to a pronounced reduction of the occurrence of maternal complications during pregnancy and puerperium.

Based on this assumption and with the purpose of reducing the gestational risks, interventional treatment (balloon mitral valvulotomy or surgery) prior to conception has been recommended to patients with severe mitral stenosis who wish to get pregnant. However, like in the present study, usually women with mitral stenosis are referred for cardiological follow-up only after diagnosing pregnancy.

Taking these facts and the low incidence of complications observed when the balloon mitral valvuloplasty is done during pregnancy this procedure should be seriously considered for all types of valve area, independently of their functional class, particularly if we take into account that acute lung edema can be the first clinical manifestation of mitral stenosis during pregnancy.

The need for contraception cannot be over emphasised in these patients as unwanted pregnancies reqiring termination adds to morbidity in these patients. The husbands of these patients should be encouraged to undergo vasectomy to reduce health risks associated with sterilisation in these patients.

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