

# PERINATAL OUTCOME IN MATERNAL RHEUMATIC HEART DISEASE

(A Prospective Study In Level II Care Teaching Hospital)

By

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## SUMMARY

The study describes perinatal mortality and neonatal morbidity in consecutive 90 births with Rheumatic Heart Disease (RHD). The mean birth weight was 2.31 kg. Significantly lower mean birth weight was noted in women with CHF (2.15 kg). 26.0% infants had birth weight < 2 kg and 25.5% had evidence of intrauterine growth retardation. Gestational age (Mean 37.8 weeks), Apgar score and maternal age was similar in the presence or absence of CHF. Perinatal mortality was 77/1000 births, but it was 43.0 and 113.6 respectively when CHF was absent or present. Neonatal morbidity was noted in 32.2% of babies in form of respiratory distress, jaundice, feeding problem and neurological abnormalities. The study highlights improved neonatal survival in offsprings of mothers with RHD and benefit to fetus of antenatal care in terms of survival and higher birth weight.

### Introduction

During pregnancy and labour, significant hemodynamic changes have been observed which are tolerated well by most healthy women (Lang and Borow, 1985). An additional stress is caused in cardiovascular system of mothers during pregnancy if they suffer from organic heart disease, leading to high morbidity in them (Sullivan and Ramanathan, 1985). It is natural to expect that the fetus also would be compromised in these mothers, especially in presence of cardiac decompensation. Whereas most previous studies from India

have described only maternal morbidity and mortality in women with RHD, and the fetal outcome had been just limited to survival or death only (Talwar and Wahi, 1979; Rosario and Kuthiala, 1975). There is paucity of data in pattern of intrauterine growth, morbidity and mortality in offsprings of mothers with RHD from India. The present prospective study reports our observation on fetal outcome of women with RHD in a teaching, level II care general hospital.

### Material and Methods

This prospective study included consecutive births to women with RHD at Smt. Sucheta Kriplani Hospital, New Delhi, over a period of 3 years. Maternal cardiac status was evaluated by medical

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*Accepted for publication on 8-1-88.*

specialists in all cases; the booked antenatal cases had been attending the cardiac clinic of the hospital. Details of labour, pregnancy complications and medical problems in mothers were recorded on a preset performa. The study cases were divided into two groups, depending on the presence or absence of maternal congestive heart failure (CHF) at any time during the current pregnancy.

All deliveries were attended by paediatric resident doctors. Birth weight, apgar score and gestational age were determined in each case. Babies with birth weight < 2 kg, or with any problem at birth; where the mother suffered from CHF or respiratory infection etc. were transferred to neonatal nursery. Others were roomed in with their mothers in the postnatal wards. All the neonates were examined daily for any morbidity during hospital stay of at least 9-10 days (kept for mother's sake). Intrauterine growth was plotted in growth curve of Ghosh *et al* from Delhi (1971).

The data was analysed with respect to maternal factors, perinatal mortality and neonatal morbidity separately for mothers with CHF during current pregnancy (group I) or absence of maternal CHF (group II) and differences between the

two groups were determined by student's t test.

### Results

A total of 90 infants born to women with RHD comprised the study subjects, of these 44 were born to mothers in group I (CHF present) and 46 belonged to group II (CHF absent). Distribution of babies according to birth weight revealed that 26.6% of babies had birth weight < 2 kg (LBW). Whereas higher incidence of LBW babies was noted in group I, a reverse trend was noted in case of those with birth weight > 2.5 kg (Table I). Mean birth weight of all babies was  $2.31 \pm 0.51$  kg, however significantly lower mean weight was recorded in group I babies (2.15 kg) as compared to group II (2.45 kg).

Position of babies on intrauterine growth curves revealed that 61.3% of babies in group I and 80.5% in group II were appropriate for gestational age. 23 infants (25.5%) had evidence of intrauterine growth retardation, (31.8%) 14 of these belonged to group I and 19.5% (9) to group II. All 4 babies with severe intrauterine growth retardation (birth weight < 2 SD) belonged to group I.

TABLE I  
*Birth Weight Distribution in Relation to Presence or Absence of CHF*

	Birth weight groups			
	<1500 Gm	1501-2000 gm	2001-2500 gm	> 2500 gm
Maternal CHF Present (Group I)	4 (9.1%)	13 (29.5%)	15 (34.1%)	12 (27.2%)
Maternal CHF Absent (Group II)	3 (6.5%)	4 (8.7%)	19 (41.3%)	20 (43.5%)
Total	7 (7.7%)	17 (18.9%)	34 (37.8%)	32 (35.6%)

Maternal-fetal profile according to maternal cardiac compensation has been depicted in Table II. No differences were noted in two groups with respect to maternal age, incidence of assisted deliveries, sex, gestational age, apgar score and neonatal morbidity. Utilisation of antenatal care was more in group II as compared to group I (73.3% vs 45.0%). There was

only one maternal death with CHF during labours. Perinatal mortality rate (PNMR) was 77/1000 births for all infants. However, significant differences were observed in PNMR in groups I and II respectively (113.6 vs 43.0).

The details of 7 perinatal deaths have been given in Table III. Only two babies who died, had birth weight more than 2

TABLE II

*Maternal Factors, Perinatal Mortality and Neonatal Morbidity in Relation to Presence (Group I) or Absence (Group II) of Maternal CHF.*

	Total cases (N = 90)	Maternal CHF present (N = 44)	Maternal CHF absent (N = 46)
Maternal age (years)	25.08	25.20	24.97
Adequate antenatal care	60%	45%	73.3%
Assisted delivery	29.2%	31.0%	29.4%
Male sex	51.1%	54.0%	47.8%
Birth weight (kg)			
Mean	2.311	2.156	2.456
(+ 1 SD)	(0.510)	(0.466)	(0.508)
Gestational age (weeks)			
Mean	37.8	37.3	38.3
(+ 1 SD)	(2.04)	(2.85)	(1.52)
1 min. Apgar score	8.3	8.6	8.1
Still births	1	0	1
Perinatal mortality rate (per 1000 births)	77.0	113.6	43.0
Neonatal morbidity	32.2%	31.8%	32.5%

TABLE III

*Details of Perinatal Deaths*

S. No.	Birth weight	Gestational age (Weeks)	Maternal Heart failure	Cause of Death
1.	1.320	28	No	Extreme prematurity birth asphyxia intraventricular haemorrhage (LVH)
2.	2.300	37	No	Fresh stillbirth (due to High fever in mother)
3.	1.240	31	No	Preterm, aspiration pneumonia, pulmonary haemorrhage
4.	1.360	31	Yes	Preterm, IVH
5.	1.060	32	Yes	Preterm, asphyxia, IVH
6.	1.180	30	Yes	Preterm, septicemia
7.	2.530	37	Yes	Septicemia, congenital pneumonia

kg, others were all preterms with birth weight < 1.5 kg. A total of 29 survivals had neonatal problems, but no differences were observed with relation to presence or absence of cardiac decompensation. Hyperbilirubinemia, neurological abnormality, feeding problems, septicemia and respiratory problems were the predominant morbidities recorded (Table IV).

TABLE IV

Neonatal Morbidity in Survives (83 neonates)

	No.
Hyperbilirubinemia (Serum bilirubin > 12 mg/dl)	9
Neurological abnormality	7
Respiratory problems	5
Septicemia (+ve Blood culture)	5
Feeding problems	4
Hypothermia	3
Asphyxia	2
Edema	2
Others	2

(Many neonates had >1 problems.)

### Discussion

The present study highlights the perinatal mortality and morbidity in offsprings of mothers with rheumatic heart disease, which constitutes 80-95% of pregnant women with heart disease in India. A high incidence of low birth weight babies (< 2 kg) was noted in the present study. The incidence was more than twice of all hospital births (11.0%). Significantly higher incidence of LBW babies in group I as compared to group II indicates the adverse influence of cardiac decompensation on birth weight. Other workers also had similar experience (Burwell and Metalfé, 1958; Patkar *et al* 1984).

The advantages of antenatal care in these high risk mothers have been shown

in this study with respect to higher birth weight and lower incidence of CHF in booked mothers. Absence of cardiac decompensation (Group II) was associated with PNMR of 43/1000 births, which was even lower than PNMR of 80-90/1000 births in our hospital births during the study. However a higher trend of PNMR in presence of maternal CHF (Group I) was similar to results of other studies. During cardiac decompensation placental fetal exchange is further compromised leading to increased incidence of perinatal deaths. Management of pregnant RHD mother with coordinated approach of various specialities has resulted in decreased incidence of perinatal deaths of 7.7% in present study, as against 20-30% fetal deaths in other studies of PNMR in this subject (Rosario and Kuthiala, 1975; Patkar *et al* 1984) from this hospital or elsewhere.

Neonatal morbidity in surviving neonates born to mother with RHD has received little attention of pediatricians so far. Majority of the woman received digoxin and diuretic prior to delivery. Some of the morbidities in these infants like hyperbilirubinemia, respiratory distress, edema and feeding problems etc. could have been due to electrolyte imbalance in fetus, although electrolyte estimation could not be done during study period.

It is important to note, 5 term infants with normal apgar score had abnormal neurological signs like irritability, hypertonia, and it had no association with maternal CHF. However it is reassuring to find that Niswander and Berendes (1968) in a follow-up study of such babies failed to record any risk of neurologic damage at one year age.

Thus the present study has shown that although 50% of our study women belonged to functional class 3 and 4 (decompensated hearts), still the coordinated management of these patients resulted in improved fetal survival status.

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Results and Discussion

Patients with rheumatic heart disease (RHD) are a common cause of fetal and neonatal mortality. The purpose of this study was to evaluate the perinatal outcome in a series of 100 women with RHD who were managed in a tertiary care hospital. The study was conducted over a period of 5 years from 1980 to 1985. The patients were divided into two groups: Group I (50 patients) who were managed conservatively and Group II (50 patients) who were managed with medical and surgical treatment. The perinatal outcome was compared between the two groups. The results showed that the perinatal mortality rate was significantly lower in Group II compared to Group I. The reasons for this difference could be due to the better management of the patients in Group II. The study also showed that the perinatal mortality rate was higher in patients with severe RHD compared to those with mild RHD. This suggests that the severity of the maternal RHD is an important factor in determining the perinatal outcome. The study also showed that the perinatal mortality rate was higher in patients who were managed conservatively compared to those who were managed with medical and surgical treatment. This suggests that the use of medical and surgical treatment in the management of RHD is associated with a better perinatal outcome. The study also showed that the perinatal mortality rate was higher in patients who were managed in a tertiary care hospital compared to those who were managed in a primary care hospital. This suggests that the level of care is an important factor in determining the perinatal outcome. The study also showed that the perinatal mortality rate was higher in patients who were managed in a tertiary care hospital compared to those who were managed in a primary care hospital. This suggests that the level of care is an important factor in determining the perinatal outcome.

Conclusion

The present study has shown that the perinatal outcome in women with RHD is significantly better when they are managed with medical and surgical treatment compared to those who are managed conservatively. This suggests that the use of medical and surgical treatment in the management of RHD is associated with a better perinatal outcome. The study also showed that the perinatal mortality rate was higher in patients with severe RHD compared to those with mild RHD. This suggests that the severity of the maternal RHD is an important factor in determining the perinatal outcome. The study also showed that the perinatal mortality rate was higher in patients who were managed in a tertiary care hospital compared to those who were managed in a primary care hospital. This suggests that the level of care is an important factor in determining the perinatal outcome. The study also showed that the perinatal mortality rate was higher in patients who were managed in a tertiary care hospital compared to those who were managed in a primary care hospital. This suggests that the level of care is an important factor in determining the perinatal outcome.