

NEONATAL MORBIDITY AND MORTALITY IN PRETERM BABIES IN SOUTH INDIA-A PRELIMINARY REPORT

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SUMMARY

Two hundred and fifty-seven preterm neonates (including 9 sets of twins) were studied to find neonatal morbidity and mortality. The perinatal mortality rate was found to be 35/1000 deliveries. The neonatal mortality rate decreased significantly with increase in gestational age as well as birth weight of the neonates. Sixty-two per cent of total deaths were due to birth asphyxia and respiratory problems.

Birth asphyxia, physiological jaundice, respiratory distress and septicaemia were the main neonatal morbidities. The neonatal morbidity decreased with increase in the gestational age. In the changed scenario due to improved biomedical technology, the effective role of clinicians is stressed to prevent avoidable causes of preterm labour.

INTRODUCTION

Preterm delivery, which accounts for over 75% of perinatal morbidity and mortality, remains the most important obstetric problem in the world today (Lipshitz and Brown, 1986). In the developed countries, preterm birth is the leading cause of neonatal death (Rush et al, 1976). Preterm babies form a sizeable number in developing countries like India and are at much disadvantage in respect of their survival as compared to term infants. Though there have been many hospital based studies on

neonatal mortality in India, there are very few hospital based prospective studies on the immediate as well as long term outcome in terms of mortality and morbidity pattern of preterm newborns. In order to evolve effective strategies to improve neonatal survival and quality of survivors, it is mandatory to have insight into the mortality and morbidity pattern as well as determinants of neonatal survival in preterm neonates. The present communication is the preliminary report of the on going prospective study to find out immediate mortality and morbidity pattern as well as long term sequelae amongst the preterm babies delivered in a tertiary institute in South India.

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MATERIAL AND METHODS

Two hundred and fifty seven preterm babies (including 9 sets of twins), born in the Labour Ward of the Department of Obstetrics and Gynaecology, Jawaharlal Institute of Postgraduate Medical Education & Research (JIPMER), Pondicherry, during the calendar year 1991 and their mothers, constituted the study subjects. All the maternal and obstetrical factors like age, previous obstetric history with special mention of previous abortions or preterm deliveries, booked or unbooked, height, weight, presence of any diseases like heart disease, hypertension, diabetes, presentation of foetus, presence of obstetric complications like multiple pregnancy, hydramnios or antepartum haemorrhage, mode of delivery and any intrapartum complications, maternal haemoglobin status were recorded in a pre-tested predesigned proforma. The birth weight was recorded immediately after delivery. The Apgar score was recorded at 1 and 5 minutes. The gestational age of the babies were recorded in completed weeks as calculated from the first day of the last menstrual period and correlated with (Dubowitz et al, 1970).

Only those babies who needed special care were managed in the Neonatal Unit of the Department of Paediatrics and others were managed in the postnatal ward by the mother's side. The babies were followed up in the Well Baby Clinic and paediatric outpatient department upto a period of one year.

RESULTS

The total number of deliveries in the JIPMER Hospital during the calendar year 1991 were 3,890 (including 51 sets of twin); there were 3,793 live births and 97 still births and 39 early neonatal deaths giving the overall perinatal mortality rate of 35/1000 deliveries. Two hundred and fifty-seven preterm neonates (including 9 sets of twins) were delivered during the same period (6.3%), out of them 50 neonates died in the hospital in the neonatal period (19.45%).

The relation of preterm live births and neonatal deaths to gestational age and birth weight is depicted in Table I. The neonatal mortality rate decreased significantly with increasing gestational age ($X^2 = 41.68$, $P < 0.001$) as well as birth weight of the neonate

Table I

Relationship of gestational page and birthweight with neonatal mortality

Gestation (weeks)		Birth weight (gms)					Total	Neonatal mortality
		< 1000	1000-1200	1201-1500	1501-2000	> 2000		
28	Deaths	2	1	0	0	0	3	100.0
	Survivors	0	0	0	0	0	0	
28 - 31	Deaths	4	4	5	2	1	16	59.2
	Survivors	0	3	3	5	0	11	
32 - 34	Deaths	0	8	5	5	0	18	17.8
	Survivors	1	4	15	45	18	83	
34	Deaths	0	1	2	1	9	13	10.3
	Survivors	1	12	19	88	87	207	
Neonatal mortality (%)		85.7	53.8	38.7	8.3	10.3	19.5	

$X^2_3 = 60.6, P < 0.001$). Different primary causes of early neonatal deaths are shown in table II. Sixty-two per cent of total deaths were due to birth asphyxia and respiratory problems.

Majority of the neonates belonged to percents from low socioeconomic status. The majority of neonatal mortality occurred due to lack of antenatal care (23.7% in unbooked case as compared to 7.1% amongst booked case). Maternal anaemia predisposed to a ten-fold increase in neonatal mortality. Neonatal mortality was 5.0% amongst mothers with haemoglobin value of 11 to 12.5 g/dl compared to 50.0% in mothers with Hb 8.5 g/dl. Other obstetric factors associated with neonatal mortality were PIH (14%), PROM (14%), APH (14%), malpresentations (14%), hydramnios

(4%), multiple pregnancy (6%), syphilis (2%) and cord prolapse (2%). Maximum neonatal mortality was observed when the mode of delivery was assisted breech delivery (31.6%) in contrast to 17.5% in spontaneous vaginal deliveries and 18.1% in lower segment caesarian section.

Birth asphyxia, physiological jaundice, respiratory distress and septicaemia were the main neonatal morbidities. Amongst the others were conjunctivitis, diarrhoea, transient tachypnoea, convulsions and oral thrush. The relationship of these morbidities with gestational age is shown in Table III. Total neonatal morbidity decreased with increase in gestational age (91% at 28-31 weeks to 47% at 35-36 weeks).

Table II

Primary causes of neonatal mortality

	No.	%
1 Birth asphyxia	22	44
a) Severe	15	30
b) Moderate	7	14
2 Respiratory problems	9	18
a) Hyaline membrane disease	7	14
b) Meconium aspiration	1	2
c) Asphyxiating thoracic dystrophy	1	2
3 Haemorrhagic disorders	9	18
a) Intracranial haemorrhage	7	14
b) Disseminated intravascular coagulation	2	4
4 Septicaemia	4	8
5 Pathological jaundice	3	6
6 Lethal congenital malformations	2	4
7 Necrotising enterocolitis	1	2
Total	50	100

Table III

Relationship of neonatal morbidity to gestational age in survivors

	Gestational Age in weeks			Total
	28 - 31	32 - 34	35 - 36	
Number of survivors	11	83	113	207
Severe birth asphyxia	0	4	5	9
Moderate birth asphyxia	4	18	11	33
Physiological jaundice	5	18	22	45
Pathological jaundice	0	4	0	4
R. D. S.	0	6	2	8
Septicaemia	0	5	1	6
Miscellaneous (mainly conjunctivitis)	1	16	12	29
Total morbidity	10	71	53	134
% morbidity	91.0	86.0	47.0	64.7

The main maternal factors associated with the neonatal morbidity were PROM, severe PIH, APH and breech delivery.

Different types of congenital malformations found were ambiguous genitalia (2), Mongoloid facies (2), meningomyeloceles with spina bifida (1), asphyxiating thoracic dystrophy (1), jejunal atresia (1) and congenital syphilis (1), talipes equino varus (1) and PDA and VSD (3).

Preliminary analysis of a sample of 50 preterm babies who were followed upto one year in paediatric outpatient revealed that those who had severe birth asphyxia (SBA) and respiratory distress at birth were found to suffer from more of recurrent respiratory tract infections and constipation. One baby with SBA with birth weight of 2.03 kg had cerebral palsy at 8 months of age. The baby was delivered spontaneously vaginally to a mother with uterovaginal prolapse with prolonged PROM for more than 48 hours. Other morbidities observed were coryza, abdominal colic, scabies and respiratory tract infections mainly

during the first 6 months of life.

DISCUSSION

The incidence of preterm delivery rate varies from country to country and from institution to institution and has been reported to vary from 5-10% of all births in developed countries (Rush et al, 1976; Creasy and Liggins, 1979 and King, 1987). About 8-10% of Indian babies are born preterm (Singh, 1985). The incidence of preterm births in our hospital (6.3%) is rather low when compared to 13.2% found in a study from Kanpur, North India (Bhalla et al, 1977). This may be attributed to improvement in the management of preterm labour and preventing the preterm delivery over a period of more than a decade.

The neonatal mortality rate of 19.45% amongst the preterm babies is lower than the earlier reports from various parts of India, e.g., Bhatia et al (1984) - 13.1%, Singh (1986) - 21.4%, Bhakoo et al (1975) - 30.5% and Karan (1987) - 32.6%. The neonatal mortality (NNM) in the present study decreased progressively

with increase in gestational age has been observed in a study from Varanasi (Garg et al, 1987). Bhalla et al (1977) found a quite high (88.37%) neonatal mortality between 28-31 weeks of gestation. Similarly the NNM figures observed by Bhatia et al (1984) in a rural based hospital at Wardha were 86.05%, 57.88% and 41.67% in gestation less than 32 weeks, 33-34 weeks and 35-36 weeks respectively. The neonatal mortality rate figures in various gestation group from our hospital is also lower when compared to a similar study from Hyderabad in South India (Karan et al, 1987). The low NNM figures may be attributed to better present day technology, neonatal care due to coordination between residents and consultants of both the departments.

The weight-wise survival pattern of our hospital, though comparable to other Indian studies (Bhakoo et al, 1975; Bhatia et al, 1984; Singh et al, 1986; Karan et al, 1986) falls much below the acceptable figures of any good perinatal care unit where the uncorrected survival figures are expected to be 100% at 2001 g or above and about 90-100% between 1501-2000 g and 50-70% between 751-1000 g (Beazley 1986). Poor socio-economic status, lack of antenatal care and lack of level III neonatal care seem to be the underlying cause.

The morbidity rate in a study by Bhalla et al (1977) was higher (75%) as compared to our study (47%). Total morbidities in the babies between 28-31 weeks were 91% in the survivors and mainly had physiological jaundice and moderate birth asphyxia. Bhalla et al (1977) observed hypoxia at birth as high as 57.35% as against 40% in our cases. The main morbidities in our cases between 32-34 weeks were moderate birth asphyxia (25.3%), physiological jaundice (25.3%), respiratory distress (8.5%) and septicaemia (7.1%). In Bhalla's (1977) series, skin infections were seen as frequently as 14.12% and diarrhoea as high as 11.31%. Whereas diarrhoea was seen only in one case and scabies in 3 cases, the common

morbidities from 35-36 weeks in our series were moderate birth asphyxia (20%), physiological jaundice (44%) and birth asphyxia (10%), whereas respiratory conditions were seen in 33.64% of Bhalla's (1977) series. Other common morbidities in their series were diarrhoea and skin infection in 17.7% and eye infection in 12.39%.

With the improved survival due to biomedical interventions, there is now an increased concern about quality of survival and foetal handicap is therefore more important index of improved care (beazley, 1986). The incidence of 2% cerebral palsy in the follow up of 50 cases is unacceptably high for developing countries like India especially for most of those who are not reared under favourable or optimal conditions. Though it is heartening to note that more and more neonates with congenital heart disease are surviving, they have subsequent morbidities. There is an urgent need for their treatment at the earliest by appropriate surgical intervention and follow up so as to improve the quality of life.

Thus, preterm labour though occurring in small percentage (6.3%) of South Indian babies contributes to a sizeable quantity of neonatal mortality and morbidity. The reduction of deaths during neonatal period is a major challenge to all those concerned with the care of newborn. With the improved survival of the preterm babies due to improved biomedical technology, prevention of major handicaps in the survivors will be of concern to the obstetricians and perinatologists in future. Though the greatest challenge to perinatal medicine is to find the key to prevention of preterm birth, much of which may be beyond the scope of medicine and more dependent on social and economic influences; meanwhile the clinicians must concentrate on the effective ways and means of reducing the preventable or avoidable causes of preterm labour and appropriate intrapartum and neonatal care and follow up of babies 'born too soon'.

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