

# PERINATAL MORTALITY: A HOSPITAL BASED STUDY

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## ABSTRACT

*Three thousand seven hundred and two deliveries between January and December, 1990 were the study subjects. The perinatal mortality rate (PNMR), stillbirth rate (SBR) and early neonatal death rates (ENDR) were found to be 57/1000, 35.1/1000 and 22.7/1000, respectively. The preterms had much higher PNMR, SBR and ENDR as compared to term babies. Term babies weighing  $\geq 2500$  g had a PNMR of 18/1000. In preterm and term babies the mortality was reduced considerably with increase in birth weight (BW). The unbooked deliveries had significantly higher PNMR, SBR and ENDR compared to booked deliveries. The fall in PNMR compared to observations of a decade ago was due to a fall primarily in ENDR, with SBR remaining unchanged signifying failure of existing MCH set up. Nearly, 92% of ENDR were in first 72 hours which signifies the need for developing and strengthening the intensive care facilities along with timely referral of high risk mothers.*

**Key words:** *Perinatal mortality, Stillbirths, Early neonatal deaths.*

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Perinatal mortality is considered a sensitive index of neonatal and maternal care, reflecting the health and other sociobiological factors of the mother and infant. The alarmingly high rate of perinatal mortality in India makes it a major health problem, necessitating a precise definition of the factors which contribute to its high incidence. In view of this, the present study was conducted to determine perinatal mortality (PNMR), stillbirth (SBR) and early neonatal death (ENDR) rates and their relationship with birth weight, gestational age and maternal antenatal care. A decade ago (1) the perinatal mortality rate at Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Pondicherry was reported to be 80.7/1000. In this communication, we have tried to analyse the change in PNMR, and the factors responsible, over the last decade.

## Material and Methods

Three thousand seven hundred and two consecutive births which were delivered in JIPMER, Pondicherry, during the period January to December, 1990, constituted the study material. All the fetal deaths and early neonatal deaths in the period extending from 28 weeks of gestation to less than 7 completed days of life were included in this study. The mothers were considered booked cases if they had visited the antenatal clinic at least three times before delivery. All intrauterine deaths were examined in detail within 2 hours of the delivery. Autopsies and biopsies were performed in 60 of the perinatal deaths. The final diagnosis was arrived at monthly perinatal conferences attended by all the pediatricians and obstetricians. The statistical significance was tested by applying  $\chi^2$  test.

The newborn care unit is manned by trained nurses and resident doctors (junior

and senior) who take care of the babies round the clock. It is equipped with servo-controlled incubators, centralized suction and oxygen facilities, phototherapy and warmer units and facilities for investigative work up.

## Results

The total perinatal mortality rate (PNMR) was 57/1000, with a stillbirth rate (SBR) of 35.1 and early neonatal death rate (ENDR) of 22.7. The PNMR, SBR and ENDR were 11, 10 and 16 times, respectively in preterms compared to term deliveries ( $p < 0.001$ ). The PNMR among unbooked cases was more than twice that of booked cases ( $p < 0.001$ ). The ENDR was less than twice ( $p < 0.05$ ), whereas the SBR was more than 3 times ( $p < 0.001$ ) in unbooked cases as compared to booked cases (Table I). The differences in PNMR between booked (28.3) and unbooked (70.6) deliveries was significantly more among singleton deliveries ( $p < 0.001$ ). The still births were markedly low in booked (17 out of 1273 births) compared to unbooked (110 out of 2322 births) singleton deliveries ( $p < 0.001$ ). The ENDR was also significantly low in booked (19 out of 1256 live births) compared to unbooked (54 out of 2212 live births) singleton deliveries ( $p < 0.05$ ). The difference in PNMR amongst the booked (106.4) and unbooked (100.0) twin deliveries was not statistically significant.

Analysis in relation to gestation revealed that the PNMR was 4 times higher in unbooked (37.1) compared to booked (9.2) term births ( $p < 0.001$ ). The SBR was 5 times (unbooked 24.7; booked 5.0) ( $p < 0.001$ ) and ENDR 3 times (unbooked 12.7; booked 4.2) ( $p < 0.01$ ) higher in unbooked group. The PNMR were similar in preterms irrespective of booking status (booked 287.1; unbooked 299.7); however, the SBR was higher in unbooked (189.3) compared to booked

(128.7) preterm deliveries. Number of post term deliveries was too small for comparative analysis in relation to booking.

The data in Table II show an inverse relationship of ENDR, SBR and PNMR with birth weight in preterm and term babies. The PNMR in preterms was reduced from 850 in weight group  $< 1000$  g to 133.3 if these babies weighed  $> 2500$  g. In term babies the PNMR was 18.2 if the weight was 2500 g or more. In post term group there was only one intrauterine death in weight group of 2500 g and more out of total 69 post term births. There was only one baby weighing  $< 2000$  g in this group.

TABLE I—Still Birth, Early Neonatal and Perinatal Mortality Rates (per 1000)

Total births during study	3702
Live births	3572
Stillbirths	130
Early neonatal deaths	81
Total perinatal deaths	211
Still birth rate	
I. Booked	15.4
Unbooked	48.4
Total	35.1
II. Preterm	174.6
Term	17.4
Post-term	14.7
Early neonatal death rate	
I. Booked	15.9
Unbooked	25.2
Total	22.7
II. Preterm	147.8
Term	9.5
Post-term	Nil
Perinatal mortality rate	
I. Booked	31.1
Unbooked	71.4
Total	57.0
II. Preterm	296.7
Term	26.7
Post-term	14.5

**TABLE II—Early Neonatal Deaths, Stillbirths and Perinatal Mortality Rates in Relation to Birth Weight and Gestational Age**

	< 1000 g	1000-1499 g	1500-1999 g	2000-2499 g	> 2500 g	Total
<b>Preterms</b>						
LB	13	49	121	123	39	345
END	10 (76.9)	14 (28.6)	14 (21.6)	13 (10.6)	-	51 (14.8)
SB	7 (35.0)	36 (42.3)	18 (12.9)	6 (4.65)	6 (13.3)	73 (17.5)
TB	20	85	139	129	45	418
PNMR	850.0	588.2	230.2	147.3	133.3	296.7
<b>Terms</b>						
LB	-	6	68	536	2549	3159
END	-	1 (16.7)	4 (5.9)	9 (1.7)	16 (0.6)	30 (0.95)
SB	-	3 (33.3)	7 (9.3)	15 (2.7)	31 (1.2)	56 (1.74)
TB	-	9	75	551	2580	3215
PNMR	-	444.4	146.7	43.6	18.2	26.7
<b>Post terms</b>						
LB	-	-	1	16	51	68
END	-	-	-	-	-	-
SB	-	-	-	-	1 (1.9)	1 (1.4)
TB	-	-	1	16	62	69
PNMR	-	-	-	-	19.2	14.5
<b>Total</b>						
LB	13	55	190	675	2639	3572
END	10 (76.9)	15 (27.3)	18 (9.5)	22 (3.3)	16 (0.6)	81 (2.26)
SB	7 (35.0)	39 (41.5)	25 (11.6)	21 (3.0)	38 (1.4)	130 (3.51)
TB	20	94	215	696	2677	3702
PNMR	850.0	574.5	200.0	61.8	20.17	56.99

Figures in parentheses indicate percentage.

The causes of early neonatal deaths and stillbirths are given in *Table III*. Out of the 81 early neonatal deaths (0-7 days), severe births asphyxia ranked as the commonest cause (33.3%). A total of 92.6% (75/81) of the END's occurred within the first 3 days with 60.5% (49/81) occurring within 24 hours. In 3 of 81 END's no definite cause could be ascertained since autopsy could not be performed in these cases. Autopsies were performed in 24 of 81 END's. Of the early

**TABLE III—Causes of Early Neonatal and Intrauterine Deaths**

Cause of death	Number	Percentage
<i>Early neonatal deaths</i>		
Severe birth asphyxia	27	33.3
Hyaline membrane disease	13	16.1
Meconium aspiration	12	14.8
Congenital malformations	8	9.9
Infections (sepsis, meningitis, pneumonia)	6	7.4
Intracranial bleed	6	7.4
Respiratory distress	4	4.9
Rh incompatibility	2	2.5
Unknown	3	3.7
<i>Intrauterine deaths</i>		
Mechanical	45	34.6
APH	24	18.5
PIH	19	14.6
Congenital anomalies	16	12.3
Rh incompatibility	4	3.1
Infections	2	1.5
Anemia	1	0.8
Heart disease	1	0.8
Others	3	2.3
Unknown	15	11.5

neonatal deaths autopsied, 8 were due to HMD, 4 meconium aspiration, 1 neonatal pneumonia, 5 intracranial hemorrhage, 3 congenital heart disease (TGV with VSD and ASD, PDA with PFO, PDA with ASD), 3 congenital anomalies (diaphragmatic hernia, 4 lobed (R) lung, posterior urethral valve with hydronephrosis). Stillbirths constituted almost 62% of the total perinatal loss (130/211) and 72.2% were due to preventable causes like mechanical causes (cord prolapse, obstructed labor, cord compression, malpresentation, prolonged II stage), ante-partum hemorrhage, pregnancy induced hypertension, infections, anemia and decompensated heart disease. Out of 130 stillbirths 30 of them were macerated, comprising 23.1% of the total intrauterine deaths. In 15 of stillbirths no definite cause could be attributed due to severe degree of maceration and failure of autopsies. Autopsies were performed in only 11 of 130 intrauterine deaths. Multiple congenital anomalies were found in the 11 intrauterine deaths autopsied [hydrops, meningoencephalocele, tetralogy of fallot, anal abnormalities and bilobed (R) lung].

### Discussion

The perinatal mortality rate (PNMR) in the present study was 57.0 with still birth rate (SBR) of 35.1 and early neonatal death rate (ENDR) of 22.7. The mean PNMR reported by the Federation of the Obstetric and Gynecologic Society of India was 66.3 (range 13-147)(2). The PNMR in studies conducted in teaching hospitals of South India were: Vellore 40.7(3), Hyderabad 71.7(4), Madras 77.4(5) and 89.5(6). The PNMR reported 10 years age(1) from this hospital was 80.7 with an SBR of 41.4 and ENDR of 39.3. This shows that there has been no appreciable fall in the SBR over the decade whereas early neonatal deaths have

been reduced considerably. This fall in ENDR over the last decade is due to improvement in the neonatal care which can be attributed to various factors like better equipped nursery, increased personnel (both residents and nursing), better trained nurses and increased awareness among pediatricians and obstetricians about the coordinated approach to bringing down the perinatal mortality.

The discernable lack of improvement of SBR does not reflect creditably on the quality of the existing maternal and child health (MCH) services. Nearly 72.2% of the stillbirths could have been prevented by better antenatal care, timely referral and intervention. The need of the hour is to improve coordination and organization at all levels of the existing health delivery system. Almost two-thirds of the mothers never utilized the facilities of antenatal services. The PNMR among booked deliveries was almost half with SBR being one third than that of unbooked deliveries. The difference in ENDR was much smaller in booked and unbooked deliveries. All efforts should, therefore, be directed to motivate mothers for antenatal check ups by health education of the masses, and para medical health workers for maximum registration of pregnant women and continuous monitoring for timely referral of high risk cases.

The PNMR was almost double in twins than in singletons. High perinatal loss in multiple pregnancies has been reported by workers(7,8). The perinatal losses in preterms was markedly higher (11 times) than that in full terms and is in accordance with the observation by other workers(8,9). Obstetricians can play a major role in bringing down PNMR by reducing the number of preterm births.

The 3 major causes of early neonatal deaths were severe birth asphyxia, hyaline membrane disease and meconium aspira-

tion syndrome. A total of 92% of the neonatal deaths occurred in the first 3 days. This warrants for improvement in the quality of perinatal care with efforts to be concentrated on intensive early neonatal care in the first 3 days of life so that a significant fall in PNMR can be anticipated.

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