

**DETERMINANTS OF PERINATAL MORTALITY  
IN RURAL AND URBAN VARANASI**

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**SUMMARY**

All the deliveries during the calendar year 1988 in the Labour Ward of the University Hospital, Banaras Hindu University, Varanasi were analysed retrospectively in order to find out the perinatal mortality and the factors associated with it. The records pertaining to a total of 1274 deliveries of Cholapur PHC of Varanasi were also analysed to find out the determinants of perinatal mortality. The hospital based data revealed that there were 195 perinatal deaths (still-births 101 and early neonatal deaths 94) and the perinatal mortality rate was 95.3/1000 deliveries. On the contrary in the rural community out of 1274 deliveries there were 108 perinatal death (46 still-births and 62 early neonatal deaths) and the perinatal mortality rate was 85.6 per thousand deliveries. In the rural community, a prior bad obstetric history of a fetal or neonatal death, occurrence of preterm birth recorded a significant association with adverse outcome and induction of labour, prolonged labour over 12 hours duration, nature of delivery, fetal distress during labour, use of manual undue force during delivery, occurrence of postpartum hemorrhage, rupture of uterus and intrapartum sepsis were factors associated with high perinatal mortality. On the contrary, eclampsia, prematurity, antepartum hemorrhage, severe birth asphyxia and congenital anomalies accounted for most of the perinatal deaths amongst the hospital deliveries. The socioeconomic, environmental, obstetric and neonatal determinants for such unacceptably high perinatal mortality are discussed.

The perinatal mortality is a sensitive indicator of maternal and child health care of a

particular community and hence is subject to much regional variability. The perinatal mortality rate of developing countries like India particularly in the rural community is unacceptably high when compared to devel-

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Accepted for Publication on 08.07.1993.*

oped nations. Uttar Pradesh records the highest perinatal mortality of our country. The hospital based data on perinatal mortality has the limitation of not being truly representative of the community at large because it often deals with highly selective high risk pregnant population for which they have been referred to the referral centre (Singh, 1986). Most of the community based studies have limitations of inadequate birth weight estimation and gestational age estimation (Kumar and Dutta, 1986).

The present study is an endeavour to audit and analyse both hospital based data as well prospective data from rural community with proposition that it will provide a better insight of the state of affairs in the maternal child health care of the entire population with particular reference to the determinants of perinatal mortality.

#### MATERIAL AND METHODS

The data pertaining to two-thousand fifty-one consecutive new borns delivered in the labour ward of University Hospital, Banaras Hindu University, Varanasi, over a period of one calendar year (Jan to Dec 1988) were analysed.

The records pertaining to a total of 1274 deliveries in nine randomly selected sub-centres of Cholapur PHC in Varanasi district were also analysed to find out the deter-

minants of perinatal mortality. The information regarding maternal age, parity, occupation, type of family socioeconomic status, antenatal registration, intrapartum care, previous obstetric history, medical and surgical complications in present pregnancy, mode of delivery indication for operative intervention, any intrapartum complications were noted. The birth weight, APGAR score at 1 and 5 minutes, need for neonatal nursery care, neonatal problems and mortalities were recorded in case of off springs. The results were analysed by simple statistical procedures and tests of significance like Chi Square and Students 't' test were applied wherever necessary.

#### RESULTS AND DISCUSSION

The data in Table I shows the perinatal outcome in urban as well as rural Varanasi. The hospital perinatal mortality (PMR) was higher than that observed in the rural community but the difference was not statistically significant. The overall perinatal mortality was 91.4/1000 births. This is unacceptably high when compared to the national average of 53/1000 births. The PMR reported from two rural centres are 85.1 and 108/1000 deliveries as reported by Mehta (1975) and Bhatia et al (1984) respectively. Much wider variation is noted in hospital based studies from different regions of India,

Table I

#### Perinatal outcome in urban and rural Varanasi

Place	Total deliveries	Live birth	Still birth	Early neonatal deaths	Perinatal deaths No. (Rate 1000 births)
BHU Hospital	2051	1850	101	94	195 (95.0)
Rural Varanasi	1274	1227	47	62	109 (85.6)
Total	3325	3077	148	156	304 (91.4)

Table II

Determinants of perinatal mortality rate in rural Varanasi (Overall PMR 85.6/1000)

		PMR/1000 births
<b>BIOSOCIAL FACTORS :</b>		
1.	Education of mother	
	upto 5	108.1
	6+	80.9
2.	Maternal age (yrs)	
	≤ 35	78.8
	> 35	103.6
3.	Parity	
	< 4	48.9
	≥ 4	76.0
4.	Maternal weight (kg)	
	≤ 40	98.2
	> 40	80.0
5.	Maternal height (cms)	
	< 140	145.8
	≥ 140	81.6
6.	Hb%	
	< 8.0	78.0
	≥ 8.0	85.4
<b>PREVIOUS OBSTETRIC HISTORY</b>		
1.	Previous history of stillbirth	
	No	79.4
	Yes	90.9
2.	Previous neonatal death	
	No	21.0
	Yes	81.8
3.	Previous bad obstetric history	
	No	58.5
	Yes	82.8
<b>LABOUR CHARACTERISTICS</b>		
1.	Type of labour	
	Spontaneous	40.1
	Induced	44.4
2.	Nature of delivery	
	Normal	38.6
	Others	375.0
3.	Undue force	
	No	39.5
	Yes	235.3
4.	Foetal distress	
	No	36.2
	Yes	750.0
5.	Duration of labour	
	< 12	39.3
	≥ 12	205.1
<b>NEONATAL CHARACTERISTICS</b>		
1.	Birth weight	
	< 2000	44.4
	2000-2500	12.5
	> 2500	4.7

ranging from 113.6 in Jaipur to 57.3/1000 births in Delhi and alarmingly high perinatal mortality of 60-120/1000 deliveries is certainly unacceptable when compared to 10-20 per 1000 in most of the developed nations of the world (Singh, 1986).

Perinatal outcome in a given population is determined by several biosocial, environmental, obstetric and neonatal factors. The

data in Table II summarises biosocial, obstetric and neonatal factors of perinatal mortality in rural Varanasi. The maternal educational level, height, predelivery weight and hemoglobin level showed inverse relationship to perinatal mortality rate. Extremes of maternal age (> 35 years) were observed to be associated with adverse perinatal outcome. Similar pattern has been observed by

Table III

## Place of delivery and perinatal mortality (only rural data)

Place of delivery	No. of deliveries	Still birth	Early neonatal death	PND No. (Rate/1000)
Hospital	54	1	4	92.6
MCH centre	12	1	0	83.3
Home	709	25	22	66.3
Dai's house	2	0	1	500.0
Nursing home	2	0	0	0.0
Others	495	19	35	109.0
Total	1274	46	62	84.8

Table IV

## Person conducted delivery and perinatal mortality (only rural data)

Person conducted delivery	No. of deliveries	Still birth	Early neonatal death	Perinatal death rate/1000
Doctor	35	1	3	11.43
Trained Nurse	30	2	1	100.0
Trained dai	44	0	1	22.7
Untrained dai	27	0	0	0.0
Relatives	602	21	10	66.4
Others	536	22	38	111.9
Total	1274	46	62	84.8

numerous other reported studies (Mehta and Jayant 1983; Bhatia et al, 1984; Puri et al, 1981; Damodar et al, 1983; Mukopadhyay and Pradhan, 1981). A prior bad obstetric history or history of foetal or neonatal loss appeared to be associated with adverse perinatal outcome. Higher perinatal mortality was also associated with induced labour, instrumental deliveries, use of undue force during labour, prolonged labour (> 12 hrs) intrapartum foetal distress and in presence of intrapartum sepsis and a low birth weight babies. These findings are consistent with other reports (Bernard and Sastrawintata, 1985; Venkatesh, 1988).

The data in Table III and IV show the impact of person conducting delivery and the place of delivery on perinatal mortality in rural Varanasi. The highest PMR was observed when the delivery was conducted in the Dai's house or by the doctors. The possible explanation for this being most probably those were the high risk cases who could not be delivered at home by the

relatives or health workers and hence had to be attended by the doctors. In the field studies conducted in the South-East Asian region, lowbirth weight, anoxia, infection, feeding problems and congenital malformations were the leading causes of perinatal deaths (WHO, 1985).

Analysis of perinatal deaths by obstetric causes helps the obstetrician to assign the cardinal causes of the obstetric factor responsible 'for the train of events leading to the perinatal death'. Unlike an autopsy which determines how a baby died, this enquiry is useful to find out why it died (Baird and Thomson, 1969). Most of the perinatal deaths at our hospital occurred amongst unbooked cases (73.8%) and, as it is evident from Table V, foetal distress, eclampsia, APH and obstructed labour (with or without ruptured uterus) were the important determinants of perinatal mortality. These are no different from the FOGSI study of 10,285 perinatal deaths, the obstetric factors were prolonged

Table V

Primary causes for perinatal death at University Hospital, Varanasi  
in relation to obstetric factors

Factors	Still brith	Early neonatal deaths	Perinatal deaths No. (Percentage)
Eclampsia-Pre-eclampsia	16	13	29 (14.8)
Foetal distress	15	28	43 (22.0)
A P H	16	06	22 (11.2)
Malpresentations (Breech/Transvedrse lie)	10	08	18 (9.2)
Obstructed labour/Rupture uterus	10	03	13 (6.6)
Foetal congenital anomaly	06	12	18 (9.2)
Multiple pregnancy	02	05	07 (3.5)
Maternal jaundice	01	01	02 (1.0)
Miscellaneous	08	14	22 (11.2)
Not known (including macerated still births)	17	94	195 (1.7)

