

## DETERMINANTS OF MATERNAL MORTALITY : A HOSPITAL BASED STUDY FROM NORTH INDIA

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### SUMMARY

This hospital based prospective study aimed at analysing 54 consecutive maternal deaths that occurred at a University Hospital from North India over a period of one year (1988). There were 2051 deliveries during the above period giving a maternal mortality of 23/1000 live births. Most of the direct obstetric deaths were attributable to hemorrhage (20%), pre-eclampsia and eclampsia (33.3%) and sepsis (13.3%). Hepatitis (6.6%) and severe anaemia (8.8%) were leading causes of maternal deaths due to indirect obstetric causes. Most of the maternal deaths occurred among unbooked cases, illiterates and among those who reached the hospital in moribund condition from far off places. This unacceptably high MMR reveals poor operationalisation of MCH care in the community.

### INTRODUCTION

The risk of dying from pregnancy or childbirth in the developing countries of the world upto 200 times higher than in the developed countries (WHO, 1985). There is also a wide regional variation in the same country. In India the maternal mortality is lowest in Kerala and highest

in the states like Mahdy Pradesh and Uttar Pradesh (Registrar General of India, 1981). The purpose of the present study was to audit and analyse the determinants of maternal mortalities at a University Hospital from Uttar Pradesh to that concerted efforts can be made to contain maternal deaths.

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### MATERNAL AND METHODS

The data regarding 45 maternal deaths

that occurred at the Department of Obstetrics and Gynaecology, Banaras Hindu University, Varanasi during the year 1988 over a period of one year were analysed. The various factors studied included the socioeconomic status, residence, literacy, distance travelled, source of referral, antenatal care received, age, parity, obstetric complications, mode of delivery, period of gestation, operative interventions, if any, duration of hospital stay, cause of death as well as perinatal outcome. The results were analysed by simple statistical method.

**Table I**  
**Primary causes of maternal mortality (n=45)**

Causes	Number	Percentage
<b>Direct</b>	<b>35</b>	<b>77.8</b>
(a) Sepsis	6	13.3
(i) Septic abortion	(5)	
(ii) Puerperial Sepsis	(1)	
(b) Eclampsia & Preeclampsia	15	33.3
(i) Eclampsia	(14)	
(ii) Severe Preeclampsia	(1)	
(c) Hemorrhage	9	20.0
(i) Antepartum hemorrhage	(2)	
(ii) Post partum hemorrhage	(3)	
(iii) Incomplete abortion	(1)	
(iv) Molar pregnancy	(1)	
(v) Ectopic pregnancy	(2)	
(d) Obstructed labour	2	4.4
(e) Ruptured Uterus	1	2.2
(f) Others	2	4.4
(i) Anesthetic complication	(1)	
(ii) Acute inversion of uterus	(1)	
<b>Indirect</b>	<b>7</b>	<b>15.6</b>
(a) Hepatitis	(3)	
(b) Severe Anaemia	(4)	
<b>Fortuitous</b>	<b>3</b>	<b>6.6</b>
(a) Pulmonary embolism	(1)	
(b) Duodenal Ulcer perforation	(1)	
(c) Leukaemia	(1)	

**OBSERVATIONS**

There were 45 maternal deaths at the Banaras Hindu University (BHU) Hospital, over a period of one year and there were 2051 deliveries during the same period. Thus maternal mortality rate (MMR) at BHU Hospital was 23 per 1000 live births.

**Causes of Maternal Mortality**

Table I depicts the causes of maternal deaths at BHU Hospital. Hemorrhage and pre-eclampsia-eclampsia and sepsis were the triad accounting for majority of maternal deaths. On the contrary, the triad of hepatitis, severe anaemia and heart disease were accounted for majority of maternal deaths due to indirect obstetric causes.

**Determinants of Maternal Mortality**

(a) **Reproductive factors** : Though the majority of maternal deaths occurred in the age group of 20-35 years the proportion of maternal deaths at extremes of age groups ( $\leq 18$  years and  $> 35$  years) were considerably high. Similarly, primigravidae and grand multi gravidae constituted a major chunk among the gravidas who died at the hospitals (Table II).

(b) **Socioeconomic factors** : More than 95% of the cases of maternal deaths were from low socioeconomic status and were illiterate.

(c) **Health care delivery** : Most of them had hardly any antenatal care. Most of them had to travel a long distance ( $> 60$  km) and were handled by the quacks or Dais before they reached the hospitals. There were hardly any formal referrals (Table III).

Table II

**General profile of mothers who died in hospital (n=45)**

Parameters	Number	Percentage
<b>Age (in years)</b>		
18 or less	5	11.1
19-30	29	64.4
31-35	6	13.4
Above 35	5	11.1
<b>Gravida</b>		
Primi	22	48.9
Multi	12	26.7
Grand multi ( $>5$ )	11	24.4
<b>Antenatal Care</b>		
Unbooked	44	97.7
Booked	1	2.3
<b>Literacy</b>		
Illiterate	43	95.5
Primary	02	04.5
<b>Socioeconomic Status</b>		
Low	44	97.7
Middle	1	2.3
<b>Residence</b>		
Rural	40	88.9
Urban	05	11.1

**DISCUSSION**

The maternal mortality rate of 23 per 1000 live births is appallingly high when compared to the other reported studies from this country (Rao 1980; Nafeesa Beebi, 1987). This is also unacceptably high and much higher than the national average of 4.05 per 1000 deliveries (ICMR, 1990). This is in marked contrast

Table III

Factors operating before the patient reached the referral hospital (n=45)

Factors	Number	Percentage
Source Referral		
Brought by relatives (NC Referral)	41	91.1
Primary Health Centre	1	2.2
Private Practitioners	3	6.7
Distance Travelled (kms)		
< = 10	3	6.6
11 - 40	3	6.6
41 - 60	7	15.6
61 - 90	16	35.6
> 90	16	35.6
Cases Treated Outside By		
Doctors	3	6.6
Quacks	10	2.2
Dais	16	35.6
No treatment	16	35.6

to the maternal mortality rates reported from developed countries. A study in Louisiana reported a maternal mortality of 0.61 per 1000 live births (Lelima et al, 1987).

Our observation that sepsis, PIH and hemorrhage are the major causes of direct obstetric deaths and hepatitis and anaemia are important leading factors among indirect obstetric causes of maternal deaths are in conformity with other earlier reported studies from this country (Table IV).

Extremes of age, primi and grand multiparity, unplanned and unbooked pregnancy and illegal abortions are well documented causes of maternal mortality (Rao 1980; WHO 1985; ICMR, 1990). Our

hospital based data reveals a picture not much different. Similarly, the women continue to be a socially disadvantaged group. Their poor status in the society, directly or indirectly, affects their nutrition, reproductive behaviour utilisation of health care facilities and vulnerability to harmful practices. This is quite evident from the fact that more than 90% of the gravidas who died in the hospitals were illiterate, came from low socioeconomic status and had no form of antenatal care what so ever. Unless mass illiteracy among women is eradicated and their status in the society improves, nothing may really change for maternal mortality. Lack of antenatal and intranatal care, nonoperational referral system and

Table IV  
Comparison of Major Causes of MMR in India

Authors	Sepsis %	Haemorrhage %	PIH %	Anaemia %	Infec. Hepatitis %	Others %
Dhurandhar (1970)	6.70	10.45	6.28	-	-	-
Heera & Das (1973)	43.80	8.20	2.80	-	-	2.80
Rao et al (1975)	38.00	27.00	9.00	-	-	2.60
Rao et al (1982)	28.67	21.53	9.59	-	32.10	8.60
*R.G.I. (1981)	13.20	23.40	8.00	13.70	-	14.90
R.G.I. (1989)	5.90	23.80	7.90	20.30	-	20.30
Sinha (1986)	6.50	40.00	15.50	-	14.00	-
Lopez et al (1986)	26.16	-	-	-	-	-
Panat & Mehendale (1988)	19.45	14.11	16.80	-	29.40	-
Present Study	13.30	20.00	33.30	8.80	6.60	11.00

\* Registrar General of India

nonutilisation of existing health care facilities are responsible for many of the maternal deaths.

Emphasis on the terminal medical condition directly responsible for the women's death is in fact an oversimplification of the problem (WHO Chronicle, 1986). Maternal deaths are the result of an interplay of socioeconomic, reproductive, medical and health service factors and the problem therefore needs to be viewed in this context. To this end, therefore, a more concerned effort at various levels of policy, programme, training and research activities need to be directed. This would be possible only when we realize that mothers' lives matter.

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