

Original Article

# AN EPIDEMIOLOGICAL STUDY OF SOCIAL FACTORS ASSOCIATED WITH MATERNAL MORTALITY IN A COMMUNITY DEVELOPMENT BLOCK OF MADHYA PRADESH

Dr K P Joshi<sup>1</sup>, Prof. S S Kushwah<sup>2</sup>

<sup>1</sup>Associate Prof., Department of Community Medicine, SVSMC, Yenugonda, Mahabubnagar, (A.P.), <sup>2</sup>Prof & Head, Dept. of Community Medicine, S.S. Medical college, Rewa (M.P.)

## Abstract

**Background-** India is among those countries which have very high Maternal Mortality Rate (301/100,000 live birth). In Madhya Pradesh MMR is much higher (379/100,000 live birth). About 78,000 women die each year due to pregnancy related causes. Social factors play important role in maternal morbidity and mortality.

**Research Question** –What is the magnitude of Maternal Mortality and its social determinants in a Community Development Block of District Satna (MP).

**Objective**– To assess the magnitude of Maternal Mortality and its social determinants. **Study Design**-Retrospective epidemiological study. **Setting and**

**Participants** - The subjects included were female deaths of reproductive age group (15-45 years) of a Community Development Block Satna (MP).

**Methodology**- The data were collected from available health records, by house to house survey and verbal autopsy in study area. **Results** - A total of 27 maternal deaths were gathered from deferent sources during one year study period, thus giving, MMR of 550/100,000 live birth. Maximum 24 maternal deaths (88.8%) occurred in the age group of 18-30 years. Around 55% maternal deaths took place in low socio economic group. Around 44.44% mothers did not take any antenatal care during their pregnancies. Around twelve maternal deaths (44%) were due to direct obstetrical causes and remaining 15 maternal deaths (54%) were due to indirect causes. The reason in 62.96% mothers for non- availing hospital treatment were financial constraints, ignorance, illiteracy, late decision, male dominance in family matters.

**Key Words**- MMR, SES, Social Factors.

## Introduction

More than half million women die in developing countries each year during pregnancy, childbirth or from related causes, making at least one million children motherless. The risk of dying of mother due to pregnancy or childbirths in developing countries is 300 times higher than in developed countries. For example, a woman in Eastern Africa faces the highest risk of maternal death 1 in 12, compared with only 1 in 3700 for women in North America. No other health indicator varies so dramatically between developed and developing countries<sup>1</sup>. According to WHO, a maternal death is defined as “the death of women while pregnant or 42 days of termination of pregnancy, irrespective of the duration and site of pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes”<sup>2</sup>.

Every one minute one female die and EVERY 5 MINUTES... one woman somewhere in India dies from a pregnancy related complication. When a woman dies, her new born baby has 6 to 10 times greater chance of dying as well, that comes to more than 100,000 maternal and 10,00,000 newborn deaths each year. India accounts for one in five of all maternal deaths around the globe every year<sup>3</sup>. According to census 2001, Madhya Pradesh is the 2nd largest state in terms of its geographical area after Rajasthan and is 7th in terms of population and contributes 5.88% of India's total population. Evidence from various rural surveys suggests that maternal deaths account for more than 2% of total deaths and about 4% of total female deaths (Department of Economics and Statistics GOMP, 1996). In Madhya Pradesh, MMR is high (379/100,000 live births) and in Satna district it is much higher<sup>4</sup>.

Determinants of maternal mortality in India are medical causes and social factors. A large number of social factors influences maternal mortality like age of the mother, age of marriage, parity, birth spacing, family size, malnutrition, poverty, illiteracy especially in rural areas. Hence present study was undertaken to assess the Magnitude of Maternal Mortality and its social determinants in study area<sup>5</sup>.

## Methodology

All female deaths (> 10 yrs age) during the period from 01-10-2002 to 30-09-2003 of study area were identified and investigated through

different sources by pre-designed, pre-tested questionnaire so that all maternal deaths could be identified. The data were re- investigated and cross checked to avoid any duplication.

## Data collection

1. Records-
  - a) Police Records.
  - b) Records from Panchayat & Kotwar.
  - c) Records of health Workers.
  - d) Hospital Records.
  - e) PHC-Records.
2. Door to door survey through personal visits by PG resident and health worker.
3. Verbal autopsy using a specified semi-structured pre-tested questionnaire by a group of PG resident of department of community medicine. SSMC Rewa(MP).

All the data collected were tabulated in Microsoft Excel 2000 software and then the analysis was done using Pivot tables. The coverage of various components related to female health is expressed in percentages.

## Results

Physical mapping of study area revealed that the total population of the study area was 2,01,236 with majority 91.90% population in Rural and 8.10% in Urban area Sex ratio in area was 949 female per 1000 male. Female literacy was much lower (51%) than male literacy (77.80%). Birth rate of study area was 32/1000 population and total fertility rate was 3. The study area was having 2 community health centres, 4 primary health centres and 32 sub health centres. Proportionate population of SC, ST and others in the study area was 12.1%, 11.5% and 76.4% respectively. Total 110 deaths of female in reproductive age group (15-45 years) were reported in the study area. Out of these female deaths, 27(24.54%) deaths were due to pregnancy related causes (maternal deaths).

During the study period, total 7062 pregnancies were reported; out of this, only 5064 (71%) pregnancies were registered for antenatal care, in any govt or private health institutions. Total 4905 live births were reported in the study area, so the maternal mortality rate was 550/100,000 live births. Out of 27 maternal deaths, 26 deaths (96.3%) were from rural area and only one (3.7%) death reported in urban area. In the caste wise distribution of maternal deaths, 33.33% were from SC,

## Address for Correspondence:

Dr K P Joshi, Department of community medicine, SVSMC, Yenugonda, Mahabubnagar, E-mail drkp\_joshi@rediffmail.com. Received: 12/09/2011 Accepted: 14/12/2011 Indian Journal of Community Health, Vol. 23, No. 2, July 2011- Dec. 2011

11.11%ST and remaining 55.55% were from other caste. Maximum 24 maternal deaths (88.8%) occurred in the age group of 18-30years.

**TABLE- 1**  
**EDUCATIONAL STATUS OF MOTHERS**

Educational Status	No. of Maternal deaths	Percentage
Illiterate	9	33.33%
Up to Middle	11	40.74%
Higher Secondary	5	18.51%
Graduate & above	2	7.42%
Total	27	100%

About 33.0% of mothers were illiterate, 40.74% studied up to 8<sup>th</sup> class, 18.51% studied up to 12<sup>th</sup> standard and 7.42% were graduate. On other hand educational status of the husband of the mother were illiterate-40%, 8<sup>th</sup> standard-30.50%, 12<sup>th</sup> standard 20.57%, graduates-8%.

**TABLE- 2**  
**SOCIO-ECONOMIC STATUS OF MOTHER**

Socio-economic Status	No. Of Maternal deaths	Percentage
I	0	0.0
II	4	14.80
III	8	29.60
IV	15	55.60
V	0	0.0
Total	27	100%

Around 55% maternal deaths took place in low socio economic group ( class IV). Maximum (15) maternal death (55.60%) in proportion to pregnancies was observed in multipara (more than 3 children). Around 60% of mother were having the birth interval of 1 year only. Around 44.44% mothers did not take any antenatal care during their pregnancies and only 14.81% mothers attended 3 or more ANC visits. Remaining 40.25% women attended less than 3 antenatal visits. This signifies that maximum deaths were reported among those mothers who did not avail any antenatal care during their pregnancy. Out of the family total 27 mothers, in 95% families decision taking power was in males. As per the verbal autopsy report, nutritional status of 80% mother was poor.

More than 70% mother did not consume any iron folic acid and calcium tablets, and did not have TT vaccination during their pregnancy. Out of total 27 mother, 20 (74%) mothers were delivered at home and in the 41.67% of cases ,delivery were attended by trained birth attendants followed by 16.66% by family members and relatives.

**TABLE- 3 ANALYSIS OF TREATMENT**

History of Treatment	No. Of Maternal Deaths ( n=27)	
	Number	Percentage %
Treatment received	21	77.78
Did not received	06	22.22
Place of Treatment	21	
Home	19	90.50%
Hospital, PHC ,CHC	02	9.50%
Person consulted		
Doctor (Qualified)	04	19.00%
Doctor (Unqualified)	11	52.40%
Health Worker	03	14.30%
Family Members	03	14.30%
Referral/Advice		
To take PHC/higher Centre	21	
Advice Followed	07	33.30%
Not Followed	14	66.70%

Around 22.22% of mothers did not consult to any doctor for pregnancy related problems. Among the mothers those who took the treatment, 90.50% were treated at home only by the unqualified doctors, and only 10% reached to hospital for treatment.

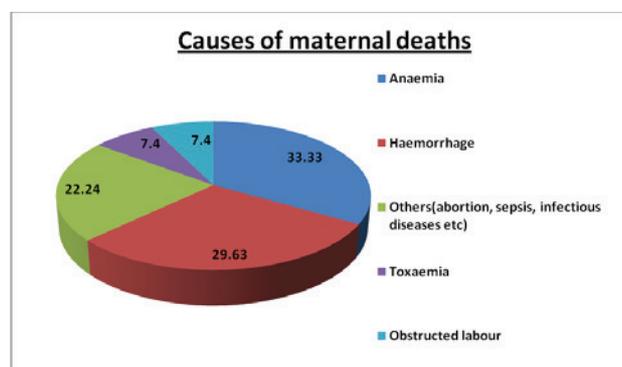
**TABLE- 4**  
**Causes of non-availing referral services**

Causes	Before intervention (N = 14)
Financial constraints	08 (57.1%)
Did not realized to be important, ignorance	03 (21.4%)
No body at home to accompany	01 (7.1%)
Could not make immediate arrangements	02 (14.3%)
Total	14 (100.0%)

**TABLE- 5**  
**CAUSES OF MATERNAL DEATH**

SN	Causes	No. of Maternal deaths	
		No.	percentage
1.	<b>Direct Obstetrical</b>	12	44.4%
	Haemorrhage	08	66.67%
	Obstructed labour	-	--
	Eclampsia	01	8.33%
	Abortions	-	--
	Intrauterine Death	03	25.00%
2	<b>Indirect Obstetrical</b>	15	55.6%
	Anaemia	09	60.0%
	Tuberculosis	-	--
	Pneumonia	03	20.0%
	Hepatitis	-	--
	Pulmonary embolism	03	20.0%
	Jaundice	-	--
	Typhoid	-	--
	Heart Disease	-	--
	Malaria / Fever	-	--
	Total	27	100%

Around 44% (12 maternal deaths) were due to direct obstetrical causes and remaining 54%(15 maternal deaths ) were caused by indirect obstetrical causes. The direct causes of maternal death were haemorrhage- 29.63%, obstructed labour-7.40%, toxemia-7.40%. Among the indirect causes of maternal deaths, anaemia was the leading cause in 33.33% mother ,followed by 22.24% other associated diseases in pregnancy like malaria, heart diseases, infectious diseases, accidents etc.



Around 11.10% deaths occurred in ante partum period and remaining 88.90% deaths took place in postpartum period. No death was reported in intrapartum period. 62.96% mothers died at home, only 25.92% mothers died in various hospitals and remaining 11.11% mothers died on the way from home to hospital.

### Discussion

Health cannot be isolated from its social context. The last few decades have shown that social and economic factors have as much influence on health as medical intervention. A number of social factors influence maternal mortality. The important ones are :

a) **Women's age:** The optimal child bearing years are between the ages of 20 and 30 years. The further away from this age range, the greater the risks of woman dying from pregnancy and child-birth. Similarly maximum 24 maternal deaths (88.8%) occurred in the age group of 18-30 years in this study.

b) **Birth interval:** Short birth intervals are associated with an increased risk of maternal mortality. Around 60% of mothers having the birth interval of 1 year only.

c) **Parity:** High parity contributes to high maternal mortality. Same factors were observed in this study. Around 15 maternal death (55.60%) in proportion to pregnancies was observed in multipara (more than 3 children).

Not only are these three variables interrelated, but there are also other factors which are involved, e.g., economic circumstances, culture practices and beliefs, nutritional status, environmental conditions. The social factors often precede the medical causes and make pregnancy and child-birth a risky venture<sup>5</sup>.

Most maternal deaths are preventable. The low status of women in the society coupled with their low literacy levels prevent the women from taking antenatal care even if services are available. Most deliveries take place at home without the services of the trained midwifery personnel. In present study out of total 27 mothers, 20 (74%) mothers were delivered at home and 41.67% of cases delivered by trained birth attendants.

In the present study area, maternal mortality rate was high, 550 per 100,000 live birth as compared to the national level data which is 407 per 100,000 live birth probably because of selection of rural area population for study, and low literacy among females, low socioeconomic status, unavailability of health care services in rural areas.

Ante natal services were not given properly for pregnant women; as around 45% of maternal deaths occurred due to this reason. There was direct relation between ANC visits attendance and education status of women and her husband. Those mothers (18.51%) who were educated up to higher secondary level, from them also only 14.81% mothers attended 3 or more ANC visits.

One very important social factor played crucial role that was male dominance in the family regarding decision taking for the birth spacing, use of contraceptives, ANC care and treatment of any complication during pregnancy.

The causes of the maternal mortality in the study were quite similar as the national statistics. According to 2001-2003 SRS survey, major causes of maternal mortality in India are haemorrhage (38%), sepsis (11%), hypertension (pre-eclampsia/eclampsia) (5%), obstructed labour (5%), unsafe abortion (8%) and other conditions (34%)<sup>6</sup>. Veena Yesikar (1996)<sup>7</sup> in a retrospective study in Sassoon General Hospital Pune (M.S.), reported haemorrhage (33.3%), eclampsia (14.3%), Sepsis (4.3%), Anaemia (4.8%) and other indirect causes (38.0%).

In the study done by Brijbala Singh (2004)<sup>8</sup>, in GMH Rewa, most common age group in maternal deaths was 15 – 20 years (37%) followed by 21 – 25 years (29%) and 26 – 30 years (18%). That means major

deaths (84%) are within the age group of 15 – 30 years. These results are similar to the one observed in the present study.

Alok Ranjan (2004)<sup>9</sup>, according to his extensive study (1998-99) of status of obstetric care in undivided Madhya Pradesh, the risk of maternal death decreases sharply with the increase in education of mother. According to him the lifetime risk of maternal death is estimated to be highest in illiterates and lowest in high-educated females and these results are quite similar to the present study.

Abdul Salam et al (1998)<sup>10</sup> (study in northern rural Tanzania), in their study on maternal mortality and morbidity reported that socio-economic status of the family was a major factor for/of maternal deaths. 80% of deaths occurred in the income group below Rs. 700/- per month. Women's poor socio-economic status and education level in the society is directly or indirectly associated to the high maternal mortality. This was also observed in present study.

### Conclusion

Maternal Mortality rate in rural area of Madhya Pradesh is quite high. Most of the maternal deaths are preventable. The low literacy levels and low socio economic level contributing in maximum number of cases. Social status of women in family and society play crucial role in women's health as well as in maternal mortality. Most maternal deaths can be prevented if pregnant women have access to good-quality of ante natal and post natal care, and also if, certain harmful birth practices are avoided.

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