

## Maternal Mortality: A Retrospective Study

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### Abstract:

**Context:** Maternal death signifies the quality of health care provided in the population. Pregnancy although a physiological state, carries risk of serious maternal morbidity and mortality sometimes. Majority of the maternal deaths in developing countries are preventable.

**Objective:** To find the causes of maternal mortality over a period of 5.3 years at a tertiary care hospital.

**Material And Methods:** Retrospective study of 45 deaths from JAN 2009 TO MARCH 2014. Maternal mortality ratio and causes were analysed and compared.

**Results:** Over the study period MMR was 277/1, 00,000 LIVE BIRTHS .The leading direct cause was SEPSIS (51.11%) & Indirect cause was ANAEMIA (62.2 %).

**Conclusions:** Maternal mortality can be prevented with proper identification and care .There is change in the trend of causes of maternal mortality. Strengthening of the first referral units with equipments, adequately competent staff and blood bank can decrease maternal mortality and morbidity. Contributing factors should be tackled to decrease death of young female. Auditing the reasons for maternal mortality in a resource poor country is extremely helpful in not only identifying the reasons but also in identifying the preventable causes of maternal mortality.

**Keywords:** Direct obstetric cause, Indirect obstetric cause, Maternal death, Maternal mortality ratio.

### I. Introduction

According to the World Health Organization (WHO), "A maternal death is defined as death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of pregnancy, from any cause related to or aggravated by pregnancy or its management but not from accidental or incidental causes" (ICD-10). Almost half a million women die every year from complications during pregnancy and childbirth. About 99% of these women are from developing world with over 90% concentrated in Africa and Asia. The maternal mortality ratio has reduced from 254/100,000 births in 2004-2006 to 212/100,000 in 2007-2009. [1] The tragedy is that these deaths are largely preventable. The progress in maternal health has been uneven, inequitable at social ,economic and regional front. Pregnancy is not a disease and pregnancy related mortality is almost always preventable.

Globally 2,87,000 maternal deaths occurred in 2010, Two countries account for a third of global maternal deaths. India accounts for 19%(56000) and Nigeria for 14%(40000)[2]

About 99% of these women are from developing world with over 85% concentrated in Africa and Asia. It is heartening to see the reduction of Maternal Mortality Ratio in Developing countries from 480/100,000 live births in 1990 to 450/100,000 births in 2005. [3]

Most of the evidence for maternal mortality is obtained through hospital data and community based reports, which are situated mostly in urban areas, whereas most of the maternal deaths are from rural areas where the deaths are underreported. This study was done to assess the causes of maternal mortality, know changing trends in maternal mortality and how effectively measures can be implemented in reaching MDG5 goal.

### II. Aims and Objectives

- 2.1 To calculate the maternal mortality ratio in our hospital.
- 2.2 To assess the epidemiological aspects of maternal mortality.
- 2.3 To assess the causes of maternal mortality.
- 2.4 To identify preventable factors leading to maternal deaths.

### III. Materials and Methods

Our Hospital-SDMCMSH is a tertiary care referral centre; situated in North Karnataka. It gets a large number of referrals from maternity homes, Primary health centres, Community health centres. The present study was a retrospective study, conducted in the department of Obstetrics and Gynecology of this hospital. Data regarding maternal mortality was collected from medical record section of our hospital. The details of maternal deaths from January 2009 to March 2014 were collected and analyzed with respect to following epidemiological parameters :- Distribution of maternal deaths in relation to age, parity index, locality wise

,socioeconomic status ,antenatal care status ,mode of delivery and admission to death interval and causes of deaths.

#### IV. Results

During the study period January 2009 to March 2014 there were 16234 live births and total of 45 maternal deaths. The mean MMR in the study period was 277/100000 live births.

The epidemiological characteristics of maternal deaths are shown in table

The total number of deaths in the years 2009 till 2014 was 45 out of 16,234 live births.

**Table 4.1: Maternal Mortality Ratio:**

Year	Total Births	Live Births	Maternal Deaths	Still Births	MMR/ 1,00,000 live births
2009	2315	2268	6	47	264.55
2010	2608	2545	10	63	392.92
2011	3170	3084	7	86	226.9
2012	3564	3466	7	98	201.96
2013	3921	3820	11	101	287.95
2014	1069	1051	4	18	380.58
Mean MMR		16234	45		277.196

Mean MMR IS 277.196

The most common cause for death in our institution is Sepsis/MODS [direct cause] accounting for 23 deaths i.e. 51.11% of the total deaths. The most common indirect cause being Anaemia with 28 deaths i.e. 62.2%. Out of 45 maternal deaths 44 were referred cases from health centres maternity homes from surrounding districts, 32 cases were booked ANC cases. 44.4% of maternal deaths were after 24 hours of admission up to 7 day. 23 women were delivered cases forming 51.1%. Among them 23 were primi-gravida accounting to 51.11%, multi-gravida were 21 i.e. 46.6% and grand multi-para was just one patient, around 2%. Anaemia being the leading indirect cause for maternal death has been classified into mild [9-11g%], moderate [7-9g%] and severe anaemia [<7g%]

**Table 4.2 Degrees of Anaemia:**

Range of Anaemia	ICMR Hb gm%	No. of cases	Percentage %
Mild	10-10.9	5	14.70
Moderate	7-9.9	19	55.88
Severe	4-6.9	9	26.47
Very Severe	<4	1	2.94

**Table 4.3 Agewise distribution:**

Age group	Number of Cases	Percentage %
<20	5	11.1
21-25	21	46.66
26-30	14	31.11
31-35	5	11.1

**Table 4.4 : Causes of Maternal Mortality:**

##### 4.4.1: Direct Causes:

Direct Causes	Number of Cases	Percentage %
Pre-Eclampsia/Eclampsia/HELLP Syndrome	13	28.8
Postpartum Haemorrhage/Antepartum Haemorrhage	5	11.11
Sepsis/Multiorgan Dysfunction Syndrome	23	51.11
Pulmonary Embolism/ Amniotic Fluid Embolism	1	2.22
Ectopic Pregnancy	2	4.44

##### 4.4.2: Indirect Causes:

Indirect Causes	Number of Cases	Percentage %
Heart disease	6	13.33
Cortical Vein Thrombosis/Cerebrovascular Accidents	8	17.77
Renal Failure	3	6.66
Anaemia	28	62.2
Bronchopneumonia	12	26.66
Hepatic Failure	5	11.11
Hepatitis B/Immunodeficiency Virus Infection	5	11.11

Mode of Delivery	No of Cases	Percentage %
Vaginal	21	80
Elective CS	2	8
Emer CS	3	12

**Table 4.5 Mode of Delivery :**

Mode of Delivery	No of Cases	Percentage %
Vaginal	21	80
Elective CS	2	8
Emer CS	3	12

**Table 4.6 Stage of Pregnancy at time of Death:**

Trimesters	No of Cases	Percentage %
1	2	4.44
2	6	13.33
3	18	40
Intrapartum	3	6.66
Postnatal	16	35.55

**Table 4.7 Education:**

	Literate	Illiterate
Number	5	40
Percentage%	11.11	88.88

**Table 4.8 Antenatal Registration:**

Antenatal Care	Booked	Unbooked
Number	13	32
Percentage%	28.89	71.11

**Table 4.9 No of Referred Patients:**

	Referred	Internal
Number	44	1
Percentage	97.77	2.23

## V. Discussion

- 5.1 Maternal mortality reflects the quality of maternal services given to pregnant women in the society. A high rate of the same reflects poor Antenatal care , late referrals , illiteracy and low socio-economic status . Reduction of Maternal Mortality is the objective of MDG's especially in low income countries where 1 in 16 women die of pregnancy related complications. [4]
- 5.2 The mean Maternal Mortality Ratio in our study period was 277/1,00,000 live births , this study has a comparatively high MMR probably because of the many complicated referrals from rural areas of North Karnataka in the last stages as our hospital is a Tertiary Care Centre as well as the geographical location of the institue located on the highway between Hubli and Dharwad. Various studies done in India in the last 15 years have shown a wide variation in MMR's ranging from 47/1,00,000 to 625/1,00,000 births. [4-9]
- 5.3 46% of maternal deaths were in the age group of 21 to 25 years in our study , as highest numbers of births are reported in this age group. Similarly, 51.11% of maternal deaths were reported in primigravida women The number of deaths are higher from women in rural areas accounting for -69.16%, unbooked patients (28.88 %), women belonging to low socioeconomic status. (83.33%) and illiterate women -65% All our findings were similar to studies by Lavanya Rai et al. [10]
- 5.4 Also 72.5% of maternal deaths in our study were due to direct causes. Like Hemorrhage (26.66%), Eclampsia (26.66%), and Sepsis (18.33%) . Our findings were consistent with studies by Jain,[4] Jadhav,[6] Pal,[7] Onakewhor,[8] and Shah.[9]

Even today large number of maternal deaths is due to the classical triad of Hemorrhage, Sepsis, and Eclampsia. Despite the availability of Magnesium Sulphate for prophylaxis and treatment of Eclamptic seizures , the rate of seizures and maternal complications remain high as these are preventable causes. Unfortunately, in many cases, patients were referred very late, in critical condition. Training of medical officers and staff nurses working in rural areas by programs like basic emergency obstetrics care (BEMOC) and skilled attendant at birth (SAB) training gives a ray of hope in reducing maternal mortality.

In India, in 2012 MATERNAL MORTALITY RATIO was 178 and MATERNAL MORTALITY RATE 12.4% and LIFETIME RISK 0.4%[1]

Statewise Comparison of MMR in South India:

State	MMR 2012	MMR 2007	Live Births
Karnataka	144	178	21909
Tamil Nadu	90	97	22622
Andhra Pradesh	110	134	22427
Kerala	66	81	15351

Literacy rate and socio-economic status also affects the maternal mortality ratio as seen in the above table

## VI. Conclusion

Maternal deaths can be prevented by improving the health care facilities in rural areas by ensuring round the clock availability of certain basic drugs like injection magnesium sulfate, tablet misoprostol as most maternal deaths in rural areas are still due to eclampsia and post partum hemorrhage. Early detection of high risk pregnancies and referring them to a tertiary center at the earliest can reduce the complications of high risk pregnancies. National Rural Health Mission (NRHM) can play a major role in reducing maternal mortality by advocating institutional deliveries and timely referral of high risk cases. Although we have not actually evaluated the impact of aforementioned educational programs on maternal mortality, it would be interesting to direct future studies in this regard. The govt mandate to institutionalise deliveries will have marginal results till problems like “early marriage of the girls, nutrition of the women and gender equity are looked at”.

Changing Trends	Earlier (1990)	Now (2009)
	Multigravida	Primigravida
	Haemorrhage/ Eclampsia	Sepsis/ Eclampsia/ Anaemia
	Older Age	Younger Age
	Septic Abortion/Ruptured Uterus	Eclampsia/ Sepsis
	Ectopic/ Ruptured	

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