

Births Should Not Cause Deaths: A Retrospective Analysis of Maternal Mortality at a Tertiary Care Hospital in Eastern India

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Abstract

Introduction: Pregnancy, although being considered a physiological state, carries the risk of serious maternal morbidity and at times death. This is due to various complications that may occur during pregnancy, labor or thereafter. Maternal death has serious implications for the family, the society, and the nation. Maternal mortality is universally considered as human development indicator in a country and determines the health status of the people.

Method: A retrospective hospital-based study of 65 maternal deaths was conducted over a period of 1-year from January 2014 to December 2014 in respect to maternal age, parity, booking status, residence, referral, socioeconomic class, admission death interval, and cause of death.

Result: Over the study period, there were 6277 deliveries, 5761 live births, giving a maternal mortality ratio of 1035 per 100,000 live births. Eclampsia was the leading direct cause and anemia the leading indirect cause. The age group of 20 to 30 years was crucial. The majority were primi, and most deaths were in unbooked cases transferred from outside.

Conclusion: Most maternal deaths are preventable by optimum utilization of existing maternal and child health care facilities, identifying the bottlenecks in health delivery system, early identification of high-risk pregnancies, and their timely referral to the tertiary care center.

Key words: Anemia, Eclampsia maternal death, Mortality rate, Sepsis

INTRODUCTION

Maternal mortality as defined by WHO is “the death of any woman while being pregnant or within 42 completed days of termination of pregnancy, irrespective of the duration and the site of pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.”¹ Maternal mortality is defined internationally, as maternal deaths per 1, 00, 000 live births.

Direct maternal death is the result of a complication of pregnancy, delivery, or their management. Indirect maternal death is a pregnancy-related death in a patient with pre-existing or newly developed health problem.

An estimated 2, 87, 000 maternal deaths occurred worldwide in 2010, most of which were in low-income and middle-income countries and were avoidable.² More than 800 women die per day, more than 30 die every hour. More than 85% die in sub-Saharan and south Asian regions. According to data published by Sample Registration System, India in December 2013,³ the maternal mortality rate in India is 178, with the highest maternal mortality ratio (MMR) in Assam (328) and lowest in Kerala (66). The states of Jharkhand/Bihar stand at MMR of 219 which is higher than the national average.

UN millennium development goals (MDG) has made the reduction of maternal mortality rate as a global health

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priority.⁴ To reach the target of the fifth MDG a 75% decrease in MMR between 1990 and 2015 is needed.

The high number of maternal deaths in some areas reflects inequities in access to health services and highlights the gap between the rich and poor. Maternal death has serious implications for the family, the society, and the nation. This present study was conducted to review the existing MMR and the causes of maternal death at a tertiary care hospital of rural India. So that corrective measures can be taken to reach the goal within the stipulated time frame as most of the deaths are preventable.

MATERIALS AND METHODS

This retrospective hospital-based study was carried out in the Obstetrics and Gynecology Department of Rajendra Institute of Medical Sciences, a tertiary care hospital in Jharkhand, India over a period of 1-year from 1st January 2014 to 31st December 2014. A total of 65 maternal deaths were analyzed with special emphasis on socio-demographic profile of the patient, prenatal care, parity, cause of death, time interval from admission to death, and communication facility and delay if any in reaching the tertiary care teaching hospital from the primary care center.

RESULTS

There were 65 cases of maternal mortality among 5761 live births and 6277 deliveries over the period of study giving an MMR of 1035 per 1,00,000 live births. Of these, 30 deaths (46.1%) were due to direct causes and 35 deaths (53.9%) were due to indirect causes.

The majority of deaths 31 were in the age group of 20-25 years.

The majority (51%) of the mothers who died belonged to the lower socioeconomic strata of the society.

Maximum patients (65%) were primigravida.

Maximum of the patients died within 6 h of admission.

The major cause of maternal mortality was eclampsia and pre-eclampsia.

The most prominent indirect cause for death was anemia.

75% of patients had hemoglobin <8 g%.

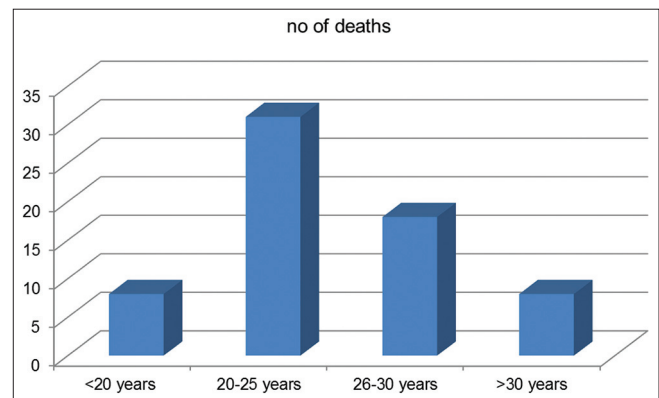
DISCUSSION

The maternal mortality rate at teaching hospitals in India is very high. Death of mother is a tragic event. A vast majority of maternal deaths are preventable. High maternal mortality indicates poor maternal and child health care (MCH). This tragedy has immense effects on the family, especially on the child.

In the present study, there were 65 maternal deaths among 6277 deliveries, giving an MMR of 1035 per 1,00,000 live births, which is higher than national averages. Rajendra Institute of Medical Sciences being a teaching institute and a tertiary care center gets complicated cases from rural areas. Admissions of moribund cases referred from the peripheral hospital have inflated this mortality ratio, like other teaching institutions of India. Like our study, other similar studies⁵⁻⁷ from tertiary care institution reported MMR being higher than the national average. This variation could be explained due to many variables, might be due to the effect of Janani Suraksha Yojana (JSY), under National Rural Health Mission, which on one side has tried to promote institutional deliveries to avert maternal deaths, on the other hand maximally unbooked complicated patients reaches hospital in moribund state, without any antenatal visit.⁸ Promotion of transport vehicles also improved death reporting by carrying complicated cases such as postpartum hemorrhage, eclampsia which previously use to die in the anonymity of their home or on the way to seek help at a medical facility.

Our study showed that 75.38% of women died between the ages of 20-30 years (Graph 1), as the highest number of women belong to this age group. Our 75.38% figure is closer with Puri *et al.*,⁹ at 71.53% and Ashok *et al.*,⁷ at 78.5%.

Multigravidas (Chart 1) comprised 35% while primigravidas 65% of the total deaths in our setup. On the contrary studies done by Purandare *et al.*,¹⁰ and Pal *et al.*,¹¹ majorities



Graph 1: Distribution of maternal deaths according to age group

of the deaths were reported in multipara (70% and 76%). Ashok *et al.*,⁷ observed that 50.8% of women who died were multipara.

The majority of deaths (93.85%) were in women belonging to low socioeconomic status (Chart 2). A similar

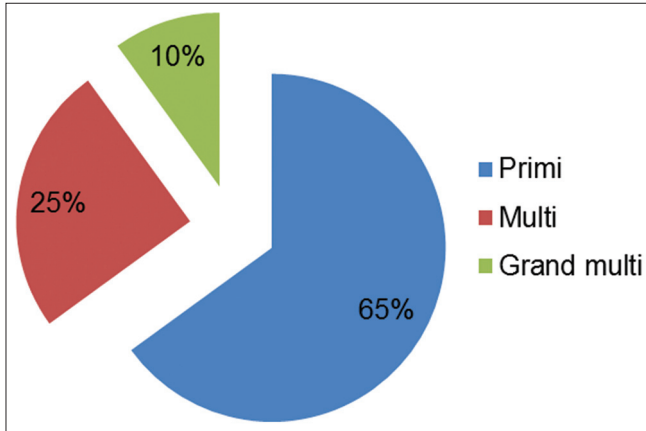


Chart 1: Distribution of maternal deaths according to parity

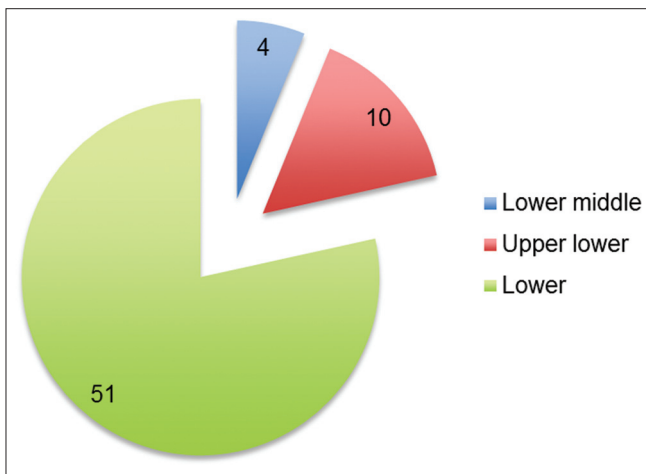


Chart 2: Distribution of maternal deaths according to socioeconomic status

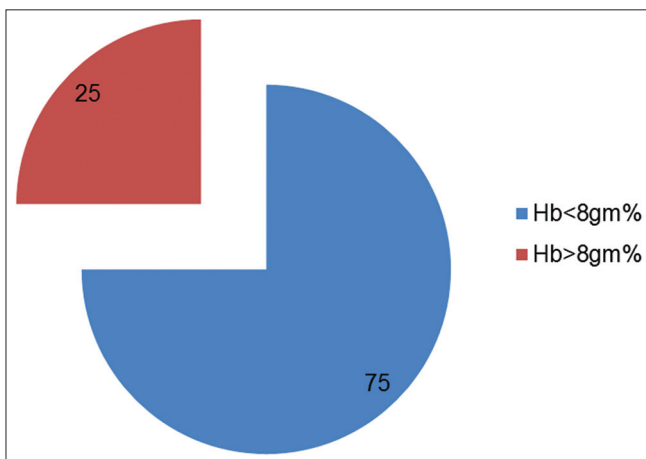


Chart 3: Distribution according to anemia status

observation was made by Ashok *et al.*,⁷ (61.5%) and Purandare *et al.*,¹⁰ (70%).

Very high percentage of unbooked patients in maternal deaths (80%) highlights the importance of adequate antenatal care. A similar observation of majority of mothers who died being unbooked was also made by various other studies.^{7,9-11} Guin Gita *et al.*,⁸ in their study of the role of JSY on maternal mortality have also stated the importance of antenatal care in reducing MMR. They state that unfortunately JSY has put an undue stress on institutional delivery without making a sincere effort to promote the importance of antenatal care for reducing maternal mortality and morbidity.

The majority of women (Table 1) died within 6 h of their reporting to the hospital as most were brought in a highly moribund state where nothing much could be done to save them. Similar data was presented by Ashok *et al.*,⁷ and Purandare *et al.*,¹⁰ (57% within 6 h). In our study, 62% of the patients died within 6 h of admission further highlighting the need for adequate and quick transport facilities and timely referral from peripheral centers for high-risk patients.

Table 1: Distribution according to time interval from admission to death

Time interval from admission to death	Number of maternal deaths	Percentage
0-30 min	5	7.69
30 min-6 h	35	53.84
6-24 h	20	30.76
>24 h	5	7.69

Table 2: Distribution of maternal deaths according to direct causes

Cause of death	Number of death	Percentage
Eclampsia and pre-eclampsia	13	20
Sepsis	9	13.8
Hemorrhage	4	6.2
Amniotic fluid embolism	3	4.6
Unsafe abortion	1	1.5

Table 3: Distribution of maternal deaths according to indirect causes

Causes of death	Number of deaths	Percentage
Anemia	26	40
Heart disease	4	6
Renal disease	2	3
Complicated malaria	1	1.53
Cerebrovascular accident	1	1.53
Sickle cell crisis	1	1.53

In the present study (Table 2), direct causes contributed to 46.1% of maternal deaths, of which eclampsia (20%) is the most common. This is in contrast to most of the studies^{7,10,11} where hemorrhage was the major direct cause of maternal mortality. Guin Gita *et al.*,⁸ and Bedi *et al.*,⁵ had also reported pre-eclampsia/eclampsia as a major direct cause of maternal mortality in their study. Puri *et al.*,⁹ have stated sepsis being the major cause of maternal death in their study with pregnancy induced hypertension as second and hemorrhage being the third. Hemorrhage was the major cause of maternal death in most studies and the third most common cause in our setup at 6.2% of the total deaths. This could be because of proper management of the third stage of labor and an efficient and well-equipped blood bank to save mothers from major blood losses and subsequent deaths. Five patients died before blood could be made available, so it becomes apparent that many of the deaths that occurred could have been avoided if they were transferred earlier (Table 3).

Indirect causes (Table 3) accounted for 53.9% of maternal deaths, anemia being the underlying cause in 40% cases. The major indirect cause of death in most studies^{7,8,10,11} was anemia with the percentage varying from 15% to 65%. Correction of anemia at grass root level is very important to prevent these deaths. MCH is essential as regular ANC check-ups can help detect and correct anemia.

Another major and easily preventable cause of maternal death is sepsis. Most of these women had delivered at home and had poor antibiotic availability.

In summary, improvements in maternal nutrition; early identification and registration of all pregnant women in the first trimester of pregnancy; identification of high-risk pregnancies promptly and referred in time to a hospital for appropriate interventions and management, including swift access to lifesaving technology are available if things go wrong; would be the measures needed to make motherhood safe. Obstetricians and public health planners will need to identify women at an elevated risk of maternal death and to develop prevention strategies to avoid the conditions that cause these deaths.

CONCLUSION

The MMR in our study is higher than the national averages. Most deaths could have been avoided with the help of good antenatal, intranatal and postnatal care, early referral, quick, efficient and well-equipped transport facilities, availability of adequate blood and blood components, and by promoting overall safe motherhood. To reduce maternal mortality and morbidity, the main thrust should be on implementing basic and comprehensive obstetrics care. Analysis of every maternal death through maternal death audit, either at the community level or at the institutional level should be carried out. It will help in identifying the actual cause of maternal deaths and deficiencies in the health care delivery system that might contribute in formulating preventive measures to reduce pregnancy-related deaths.

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