

A retrospective study of maternal mortality at tertiary care centre in rural India

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Abstract

Maternal death is defined by the international classification of disease (ICD-10) is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of pregnancy from any causes related with or aggravated by pregnancy or its management, but not from the accidental or incidental causes. Maternal death has serious implications on the family, the society and the nation. This is a retrospective study of 3 years from 2014 to 2017. Maternal deaths were analysed with reference to different parameters. The MMR in our study is lower 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 blood and blood components, and by promoting overall safe motherhood.

Key Words: maternal mortality.

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INTRODUCTION

Pregnancy although considered a physiological state, carries risk of serious maternal morbidity and at times mortality. This is due to various complications that may occur during pregnancy, labour or thereafter. Death of a woman in child birth or from pregnancy related events is a devastating experience for a family and for surviving children. Maternal death is defined by the international classification of disease (ICD-10) is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of pregnancy from any causes related with or aggravated by pregnancy or its management, but not from the accidental or incidental causes¹. Maternal Mortality Ratio (MMR) is

a very sensitive index that reflects the quality of reproductive care provided to the pregnant women. Maternal mortality ratio is the number of maternal deaths during any given time period per 1,00,000 live births during same time period². Maternal mortality ratio was 2000/100000 live birth in 1938, 1000/100000 in 1959, 560 in 1990, 540 in 1999, 370 in 2000, 254 in 2004-2006, 212 in 2007-2009, 190 in 2013. Maternal mortality ratio in Maharashtra is 149 by SRS 2001-2003 survey³. 130 by 2006, 104 by 2009 which is lesser than Millennium development Goal (MDG) of 109 by 2015⁴. MMR in Maharashtra is 87 by 2010-12 survey⁵. A population based survey carried out in India, which used longitudinal surveillance and complete coverage of vital events reported in MMR of 320/100000 live births in rural area⁶. The major contributors to maternal mortality in India are uncontrolled fertility, inaccessibility or inadequate utilization of health care facilities, unavailability of timely referral services, low education, poverty, ignorance and gender discrimination leading to inferior social status of women. The main cause of maternal death in India is still PPH but in our study the trend changed from PPH to complications of Preeclampsia and eclampsia. This study was conducted to evaluate the maternal mortality ratio in the tertiary care centre to evaluate the effect of sociodemographic factors on

maternal death and to know the causes leading to maternal death so as to identify the preventive interventions needed to reduce maternal mortality ratio.

MATERIAL AND METHODS

The retrospective study was conducted at Swami Ramanand Teerth Rural Government Medical College (SRTRGMC), Ambajogai from 2014 to 2017. A total of 33 maternal deaths were analysed with the special emphasis on sociodemographic profile of the patient, parity, cause of death and trimester of pregnancy at the time of death. Results were analysed using percentage and proportion.

RESULTS

Table 1: Year wise distribution of live births, maternal deaths and MMR

	2014	2015	2016	Total
No. of deliveries	10208	10105	10378	30691
No. of maternal deaths	10	12	11	33
MMR	97.96	118.75	105.99	107.56

Table 2A: Age wise distribution

Age	Number	%
< 19 years	8	24.24 %
20-29 years	24	72.72 %
30-39 years	1	3.03 %
40 years and above	0	0 %

Table 2B: Area of residence

Urban	02	6.06 %
Rural	31	93.95 %

Table 2C: Literacy

Illiterate	21	63.63 %
Primary School	8	24.24 %
Secondary School	4	12.12 %
Graduate	0	0 %
Post Graduate	0	0 %

Table 2D: Socio-economic Status

I	0	0%
II	0	0%
III	0	0%
IV	11	33.33%
V	22	66.6%

Table 3A: Antenatal Care

Booked	9	27.2 %
Unbooked	24	72.7 %

Table 3B: Parity

1	21	63.6 %
2	03	9.09 %
3	02	6.06 %
4 and above	06	18.18 %

Table 3C: Stage of pregnancy at the time of death

1 ST	0	0 %
2 ND	0	0 %
3 RD	02	6.06 %
Post Partum	31	93.9 %

Table 3D: Place of delivery

Tertiary care centre	22	66.6 %
Private nursing home	05	15.15 %
PHC / RHC	04	12.12 %
Home delivery	02	6.06 %

Table 4 A: Cause of Maternal deaths (Direct cause)

Direct Causes	No	%
PPH	08	24.2 %
PE and eclampsia	12	39.3 %
Embolism (sudden collapse)	03	12.12 %
Sepsis	01	3.03 %
	24	72.72 %

Table 4B: Cause of Maternal deaths (Indirect cause)

Anaemia	02	6.06 %
Hepatitis	03	9.09 %
Heart Disease	01	3.03 %
Swine flue	02	6.06 %
Anaesthetic complication	01	3.03 %
Total	09	27.27 %
Underlying anaemia	17	51.51 %

DISCUSSION

In our study of 3 years maternal mortality ratio came out to be 107.56 which is less than the national average but more than the average of Maharashtra state. 72 % patients are in 20-29 years age which is comparable to 70 % in Bhatia *et al*⁷ and 72 % in Vishwajeet Paul⁸ studies. This is because majority get married at early age and get pregnant at younger age. In our study 24.24 % are < 19 years because of prevailing customs of early marriage in Beed and Osmanabad district of Marathwada due to illiteracy and poverty. 93% of women from our study belong to rural region in comparison to study of Verma Ashok *et al* of 92 %.⁹ 63 % of women were illiterate comparable with data of Vidyadhar Bangal¹⁰. No death occurred in graduate and post graduates. 66.6 % of women were of poor socioeconomic status comparable to Tayade *et al*¹¹ of 70 % and Bhaskar K Murthy 83%¹² and Anjanadevi Santpure of 71.14 %.¹³ Majority of deaths were seen in unbooked cases with 72.7 % which was comparable to Anjanadevi Santpure 71.14 %¹³ and M Vijayshree 71.06 %¹⁴ In our study maximum maternal deaths occurred in Primigravida 63.6 % which is comparable to Dogra and Purandare's^{15,16} reports in their study and also Ratan Das *et al*¹⁷ which showed 63.25 %. This is because most of the preeclampsia and eclampsia

patients were primigravida and eclampsia took the highest toll of maternal deaths. In present study maximum deaths 93.9 % occurred in post partum period and only 2 occurred in 3rd trimester, similar reports has been reported by other study. Das *et al*¹⁷ reported in his study that maximum deaths (48.82 %) occurred in the post-partum period followed by (30.46 %) in the 3rd trimester. Similar results have also been reported by other studies^{15,16}. High numbers of deaths in post partum period indicate the need for continuous vigilance in post –partum period and prompt actions in case of problems. Intranatal care by skilled attendant, timely management and replacement of lost blood volume can reduce deaths in post partum period. It is clear that interventions that have a relatively narrow delivery channel and separate management, such as immunizations, do achieve high coverage, where as those that require functional health system and facilities, such as skilled birth attendance and postnatal care, reach half the population in need¹⁸. In our study direct cause contributed to 72.72 % of maternal deaths of which eclampsia is most common cause contributing 39.3 % which is comparable to Das *et al* 43.4 %¹⁷. Other direct causes were PPH (24.2 %), embolism (12.10 %) sepsis (3.03 %) which is comparable to SRS study 1997-2003,³ haemorrhage (PPH) 25 % and Das *et al*¹⁷ PPH 21.87%. Though eclampsia is preventable in almost all cases by good obstetric care, it was found to be leading cause of deaths (43.75 %). It is mainly due to high incidence of eclampsia in this area and delayed referral mostly after 12 hours of the incidence. Eclampsia as seen in our study was found to be the leading cause of death in study done by Roy¹⁹. Despite the availability of magnesium sulphate for the prophylaxis and treatment of eclamptic seizures, the rate of eclampsia and maternal complications remain very high. This is because magnesium sulphate will only prevent eclamptic seizures in women who are hospitalised with severe preeclampsia during labour and immediately postpartum. The high maternal mortality reported from the developing countries was noted primarily among patients who had multiple seizures outside the hospital and those without prenatal care^{20,21,22}. In addition, this high mortality rate could be attributed to the lack of resources and intensive care facilities needed to manage maternal complications from eclampsia. In the developing countries, most women will not be identified early, as most cases of eclampsia develop at home and/or during transport. Not surprisingly, the rate of preeclampsia and eclampsia is higher in the developing countries because of absent prenatal care and lack of access to proper hospital care. Indirect causes accounted 27.27% of deaths in our study. Anaemia contributed in 6.06% and was contributory in 51.51% which was comparable to 46.6% of Santpure *et al*¹³ and WHO study. Amniotic fluid

embolism was contributed to 12.12% in our study which was comparable to study of Santpure *et al*¹³ 10.44% and Tayade *et al*¹¹. Hepatitis contributes 9.09% of deaths in our study; which was comparable to Santpure *et al*¹³ 5.97% In our study 2 cases of deaths were due to H1N1 infection and 1 case of anaesthetic complication during LSCS. The socio-economic status, level of education, the quality of patients' nutrition and antenatal care of the patients in our study were very low. Lack of and/or poor prenatal care, delay in early diagnosis, progression to severe disease, delay in treatment, lack of access to hospital care, lack of access to transportation to clinic, lack of transport from clinic to hospital, lack of transport from hospital to tertiary facility, lack of well trained staff and personal, lack of proper resources and intensive care unit were responsible for high maternal mortality in our study. These results are comparable with the study done by Bangal¹⁰. So its delay at all levels is mainkiller. Although the focus during the past decade has been on the saving of lives, it is also important to look beyond survival to issues of reducing morbidity and disability and improving long term outcomes of relevance to human development. The close link among poverty, inequity, under nutrition, and human deprivation are well known, and all these factors have been shown to reduce the potential for human development considerably¹⁸. There are promising interventions that can benefit survival as well as human development²³ and there is a huge public health need to integrate the two issues. Linking the agenda for maternal and child health and nutrition with the emerging issues of long term development, human capital, and economic growth may well be the most appropriate strategy to ensure that we stay the course in solving one of the most important moral dilemmas of our times. Although the MDG target dates are in 2015, the need to keep sustained focus on maternal and child health should remain.

CONCLUSION

The MMR in our study is lower 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 blood and blood components, and by promoting overall safe motherhood. To reduce the maternal mortality and morbidity the main thrust should be on implementing basic and comprehensive emergency obstetric care. Analysis of every maternal death through maternal death audit, either at community level (verbal autopsy) or at the institutional level should be carried out. It will help in identifying the actual cause of maternal deaths and deficiencies in health care delivery system that might contribute in formulating preventive measures to

reduce pregnancy related deaths. Avoiding delay at all levels that is at home i.e. at community level, at rural health facility i. e. PHC, RH, CHC, during transport facility i.e. referral services and at tertiary care center i.e. district hospital and medical college hospitals can prevent maternal death.

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