

Maternal Mortality in a Tertiary Care Hospital: A 7-year Review

Salil Barsode¹, Vaishali Taralekar², Tushar Panchanadikar³

ABSTRACT

Background: The maternal mortality ratio over seven years was studied and the causes leading to maternal deaths and preventable factors were analysed.

Materials and methods: The records of maternal deaths from January 2011 to December 2017 (7 years) were collected. Various factors such as maternal age, antenatal registration, parity, causes of deaths, and admission to death interval were reviewed.

Results: The mean mortality rate was 185. The direct causes of maternal mortality were haemorrhage (18.1%) and preeclampsia/eclampsia (18.1%). The indirect obstetric causes were hepatitis (9.09%), anaemia (9.09), heart disease (4.54), and miscellaneous (36.36%). Most of the cases (86.36%) were referred. The majority of the deaths (81.8%) occurred in the age group of 20–30 years.

Conclusion: Early antenatal registration, identification, and management of high risk patients and their early referral to higher centres can help in reducing complications and maternal mortality.

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

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INTRODUCTION

"A maternal death is defined as the 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."

Pregnancy, childbirth, and its complications account for about half a million deaths in women every year. About 99% of these deaths are from developing world with more than 90% in Africa and Asia. The maternal mortality ratio (MMR) for India is 174 per 1,00,000 live births which is higher than Sri Lanka, Indonesia, Bhutan, Thailand, and Maldives in the South East Asia Region (SEAR), according to the World Health Statistics 2017 report. Most of these deaths are preventable. One-fifth of the global burden of absolute maternal death is borne by India; however, there is an estimated 4.7% annual decline in the maternal mortality ratio.^{1,2} India is making a progress in reducing maternal mortality and striving to meet the Millennium Development Goal number 5.²

There is a marked variation in the maternal mortality ratio and healthcare access between regions in India.^{3,4}

The progress in the maternal health is still unsatisfactory. Understanding the causes of mortality and access to obstetric services such as routine skilled birth attendance and emergency obstetric care are paramount to improve maternal health.

Most of the evidence for the maternal mortality is obtained through hospital data and community based reports, which are situated in urban areas, whereas most of the maternal deaths are in rural areas. This study was done to assess maternal mortality in a tertiary medical college hospital situated in the urban part of Western Maharashtra where large numbers of patients are referred from rural parts. This study was done to assess the causes of maternal mortality and suggest measures to reduce the same.

AIMS AND OBJECTIVES

- To calculate the maternal mortality ratio in our hospital.

¹⁻³Department of Obstetrics and Gynaecology, Bharati Vidyapeeth (Deemed to be University) Medical College, Bharati Hospital and Research Centre, Pune, Maharashtra, India

Corresponding Author: Salil Barsode, Department of Obstetrics and Gynaecology, Bharati Vidyapeeth (Deemed to be University) Medical College, Bharati Hospital and Research Centre, Pune, Maharashtra, India, Phone: +91 9822478421, e-mail: barsodes@gmail.com

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- To assess the causes of maternal mortality.
- To suggest ways to reduce the maternal mortality ratio.

MATERIALS AND METHODS

This present study is a retrospective study, conducted in the Department of Obstetrics and Gynecology of an urban, Tertiary Care Center, situated in the Western Maharashtra. It gets a large number of referrals from the primary health centers from the rural parts of western Maharashtra and maternity homes. Data regarding maternal mortality were collected from the maternal mortality register after obtaining permission from the Medical Director of the hospital. The details of maternal deaths from January 2011 to December 2017 were collected and analyzed with respect to the following parameters.

- Age-wise distribution of maternal deaths.
- Gravidity-wise distribution of maternal deaths.
- Registered/unregistered patients.
- In-house and referred patients.
- Causes of maternal deaths.

The details of number of live births from January 2011 to December 2017 were collected from the labor ward register.

Maternal mortality ratio (MMR) for the study period was calculated by using the formula:

$$\text{Maternal mortality ratio} = \frac{\text{Total no of maternal deaths}}{\text{Total no of live births}} \times 100000$$

Mean maternal mortality ratio for the study period was calculated by calculating the mean of yearly maternal mortality ratio of the entire study period.

RESULTS

During the study period, January 2011–December 2017, there were a total of 11,882 live births and 22 maternal deaths. The maternal mortality ratio in the study period was 185.1/1,00,000 live births.

Agewise distribution of maternal deaths are shown in Table 1. Maximum maternal deaths (50%) were reported in the age group of 25–29 years. More deaths were reported in multiparous women (54.54%) as compared to Primiparas (45.45%), 63.63% maternal deaths were reported in women from rural areas, and 36.36% from urban areas (30.83%). Maximum maternal deaths were reported in referred patients (86.36%) as compared to in-house patients (13.60%). The number of registered, unregistered, and outregistered patients are shown in Table 2.

In the study period, 40.9% of maternal deaths were due to direct causes. Yearwise distribution of direct causes of maternal deaths is shown in Figure 1. Hemorrhage (18.1%) and eclampsia (18.1%) were the major direct causes of maternal deaths. In the study period,

Table 1: Agewise distribution of maternal deaths

Age	Number of maternal deaths
<20	
20–24	7
25–29	11
30–34	3
>35	1

Table 2: Distribution of registered, out registered and unregistered patients

	Number of maternal deaths
Registered	2
Out	16
Unregistered	4

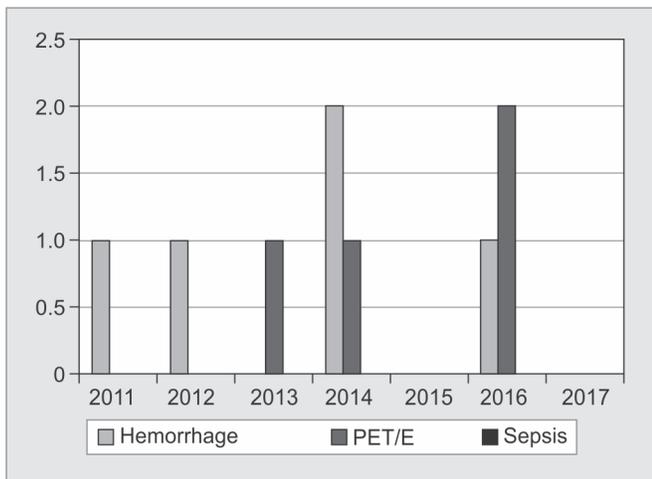


Fig. 1: Yearwise distribution of direct causes of maternal deaths

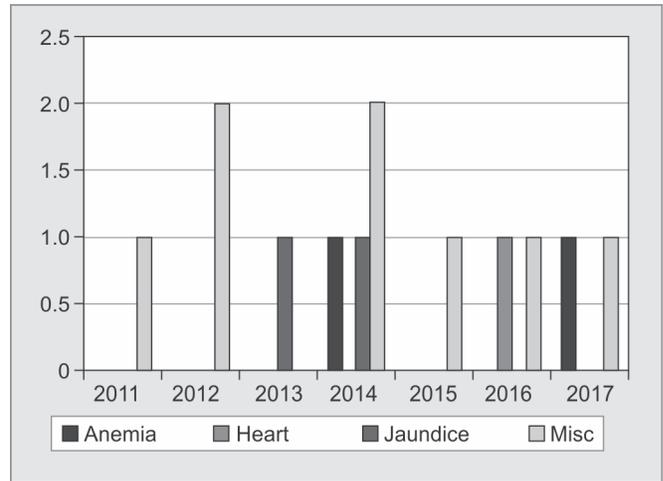


Fig. 2: Yearwise distribution of indirect causes of maternal deaths

59.1% of maternal deaths were due to indirect causes. Anemia, jaundice, and heart disease accounted for 9.09%, 9.09%, and 4.54% of maternal deaths, respectively, and miscellaneous cause such as acute viral pneumonia and dengue shock syndrome accounted for 36.36% of maternal deaths as shown in Figure 2.

DISCUSSION

Maternal mortality is an index of reproductive health of the society. An high incidence of maternal deaths reflects low socioeconomic status of the community, poor quality of maternal services, and late referral. The mean maternal mortality ratio in the study period was 185.1/1,00,000 births. The current maternal mortality ratio in India is 212/1,00,000 live births.⁵ Various studies done in India in the last 15 years have shown wide variation in maternal mortality ratio ranging from 47/1,00,000 to 625/1,00,000 births.^{6–11} Madhu Jain has reported a very high maternal mortality ratio of 2270/1,00,000.⁷ This study has comparatively high maternal mortality ratio, which could be due to the fact that our hospital is a tertiary care hospital and receives a lot of complicated referrals from the rural areas of Western Maharashtra and at a very late stage.

In our study, 81.81% of maternal deaths were in the age group of 20–29 years, as highest numbers of births are reported in this age group. Similarly, 54.54% of maternal deaths were reported in multiparous patients. More maternal deaths were reported in women who were referred patients (86.36%). All our findings were similar to studies by Jain,⁷ Jadhav,⁸ Pal,⁹ and Onakewhor.¹⁰

In our study, 40.9% of maternal deaths were due to direct causes. Hemorrhage (18.1%) and eclampsia (18.1%) were the major direct causes of maternal deaths. Our findings were consistent with studies by Jain,⁷ Jadhav,⁸ Pal,⁹ Onakewhor,¹⁰ and Shah.¹¹

Even today, a large number of maternal deaths are due to the classical triad of hemorrhage, sepsis, and eclampsia. All these are preventable causes of maternal mortality, provided the treatment is instituted in time. Unfortunately, in many cases, patients were referred very late, in critical condition, and unaccompanied by healthcare worker. Training medical officers and staff nurses working in rural areas by programs such as basic emergency obstetrics care (BEMOC) and skilled attendant at birth (SAB) training gives a ray of hope in reducing maternal mortality.

Indirect causes accounted for 59.1% of maternal deaths in our study. Anemia, jaundice, and heart disease were responsible for 9.09, 9.09%, and 4.54% of maternal deaths, respectively. These



findings were consistent with studies by Jain,⁵ Jadhav,⁶ Pal,⁷ and Onakewhor.⁸

Early detection of high risk pregnancies and referring them to a tertiary care 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 and the same applies to the urban areas as well.

CONCLUSION

Even though most maternal deaths are seen in patients from rural areas, unbooked and delayed recognition of high risk patients and their referral for institutional deliveries is a major factor for maternal deaths. Hemorrhage, eclampsia, and sepsis are major causes of maternal deaths. Upgradation of hospitals in rural area, early detection of high risk pregnancies, better transportation, and timely referral even in urban areas can definitely bring down the number of maternal deaths.

REFERENCES

1. Montgomery AL, Ram U, et al. Maternal mortality in India: causes and healthcare service use based on a nationally representative survey. *PLoS One* 2014 Jan 15;9(1):e83331. DOI: 10.1371/journal.pone.0083331.
2. WHO, UNICEF, UNFPA, World Bank (2012) Trends in maternal mortality: 1990 to 2010. Geneva: World Health Organization; p. 59.
3. IIPS (2010) District level household and facility survey (DLHS-3) 2007–2008: India. Mumbai: International Institute for Population Sciences.
4. Barros AJD, Ronsmans C, et al. Equity in maternal, newborn, and child health interventions in countdown to 2015: a retrospective review of survey data from 54 countries. *Lancet* 2012;379:1225–1233. DOI: 10.1016/S0140-6736(12)60113-5.
5. Special Bulletin on Maternal Mortality in India 2007-09: Sample registration system, Office of Registrar General, India. 2011 Jun.
6. Puri A, Yadav I, et al. Maternal mortality in an urban Tertiary care hospital of north India. *J Obstet Gynaecol India* 2011;61:280–285. DOI: 10.1007/s13224-011-0042-7.
7. Jain M, Maharaj S. Maternal mortality: a retrospective analysis of ten years in a tertiary hospital. *Indian J Prev Soc Med* 2003;34: 103–111.
8. Jadhav AJ, Rote PG. Maternal mortality—changing trends. *J Obstet Gynaecol India* 2007;57:398–400.
9. Pal A, Ray P, et al. Review of changing trends in maternal mortality in a rural medical college in west Bengal. *J Obstet Gynecol India* 2005;55:521–524.
10. Onakewhor JU, Gharoro EP. Changing trends in maternal mortality in a developing country. *Niger J Clin Pract* 2008;11:111–120.
11. Shah RJ, Ali I, et al. Analysis of maternal mortality in a small teaching hospital attached to tertiary care hospital. *Indian J Community Med* 2008;33:260–262. DOI: 10.4103/0970-0218.43234.