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Research Article

ASSESSMENT OF CAUSES OF MATERNAL DEATH IN 1 YEAR AT A TERTIARY CENTER OF CENTRAL INDIA

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ABSTRACT

Objective: According to the definition of maternal mortality, it is the "death of a woman while pregnant or within 42 days following termination of pregnancy, irrespective of the site and duration of pregnancy, from any cause connected to or aggravated by the pregnancy or its management but not by accidental or incidental cause." Studying maternal mortality and factors contributing to maternal deaths at Bundelkhand Medical College for 1 year from January 2021 to December 2021 to identify causes that can be avoided and use the knowledge, thereby produced to lower maternal mortality.

Methods: A retrospective cross-sectional study of all maternal deaths from January to December 2021. The causes of death and the time between admission and death for each maternal death were thoroughly examined.

Results: The Maternal mortality ratio in the present study was found to be 357.7/100,000 live births for the year 2021. Antepartum eclampsia was found most prevalent cause of maternal mortality in 39% cases. Other causes were pregnancy induced hypertension, severe anemia, retained placenta, hepatitis with multi organ failure, septic shock, and ruptured uterus.

Conclusion: Maternal mortality is indicator of health-care services of a nation. Better awareness and early referral can help in reducing maternal mortality significantly.

Keywords: Maternal mortality Rate, MMR in central India, Causes of MMR

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INTRODUCTION

The World Health Organization defines maternal death as the passing away of a woman, while she is pregnant or within 42 days (i.e., days 0–41) of the termination of the pregnancy, regardless of the length and location of the pregnancy, from any cause associated with or aggravated by the pregnancy or its management, but not from unintentional or incidental causes [1, 2].

The Government of India is a signatory to the Sustainable Development Goals (S.D.G.s) of the United Nations, which set a global maternal mortality ratio (MMR.) objective of fewer than 70 deaths per 100,000 live births by 2030 [3]. This necessitates an accurate measurement of maternal mortality and trends at the subnational level and an understanding of the major causes of these deaths. Like many other countries with high maternal mortality, India only records a small percentage of births, deaths, and other crucial events [4, 5]. Maternal deaths are disproportionately prevalent in rural regions and are among the least likely to be reported [6]. For over five decades, India has had a working Sample Registration System (SRS) to monitor fertility and mortality in over 1 million nationally representative houses.

It is a proxy measure of the country's maternal and reproductive health. Family members, particularly children, suffer significant health and psychological implications due to maternal mortality [7].

Most typical causes of maternal mortality are hemorrhage, anemia, sepsis, high blood pressure, unsafe abortion, and obstructed labor [8].

Maternal mortality ratio is defined as number of maternal deaths in a given period per 100,000 women of reproductive age during the same time period. According to the WHO., in 2021, between 11 and 17% of maternal deaths appear during childbirth and between 50 and 70% in postpartum. About 45% of maternal deaths occur during the first 24 h and two-thirds during the 1st week [9].

In the past decade, the maternal mortality rate in India has reduced from 206 to 181 maternal deaths per 100,000 live births [7].

Direct and indirect causes result from immediate obstetric complications in the pregnant state, such as P.P.H. and eclampsia. Indirect causes result from the previous disease developed during pregnancy, which was not a direct obstetric cause but aggravated by physiological effects.

Maternal mortality strongly reflects the overall effective health system, which, in many, suffers from weak administrative-technical logistical capacity, inadequate financial investment, and lack of skilled health workers. It is tragic as these deaths are not caused by disease but occurred during or like a natural process. It is one of the leading causes of death of women of reproductive age in many parts of the world. About 80% of maternal deaths are due to direct cause of obstetric complications of pregnancy during labor puerperium to interventions or incorrect measures. India's MMR. improved to 103 in 2017–2018 from 113 in 2016 to 2017, according to the special bulletin on MMR. released by the Registrar of India on March 14, 2022. {2}

Recent updates of MMR: March 2022, MMR. is 103 maternal mortality rate 6.5, lifetime risk 0–2% in our state Madhya Pradesh has MMR 173, maternal mortality rate 15.9-lifetime risk 0.6%.

According to the Registrar General of India's (RGI), SRS according to a report, the national maternal mortality rate (MMR.) decreased from 122 in 2015–17 to 113 in 2016–18. According to SRS 2015–17 and 2016–18, the MMR status at the federal and state levels is illustrated in Fig. 1 [10].

As evident from the above figure, MMR is highest in Uttar Pradesh, Madhya Pradesh, Rajasthan, Bihar, and Assam; on the other hand, Kerala, Andhra Pradesh, Telangana, and Maharashtra have the lowest rate of maternal mortality [10].

The present study aims to estimate the proportion of maternal deaths at our tertiary care teaching hospital to examine various causative factors.

METHODS

A retrospective cross-sectional study was conducted in a tertiary center in central India, Bundelkhand Medical College, for 1 year, from January 2021 to December 2021, by review of hospital records maternal death register to study the maternal death and complications leading to maternal deaths.

RESULTS

There were 18 maternal deaths out of 5037 live births during our study period.The maternal mortality ratio in the present study was 357.3 per 100,000 live births. The most common age group for maternal deaths was 18–25 years. About 72% of deaths occurred in this age group. The duration of hospital stay from admission to death in the majority of cases (66.6%) was < 12 hours. Out of 18,56% mothers were multigravida (Fig. 2).

During the study period, maternal deaths were observed at different stages of pregnancy. Maximum deaths [11] were reported in females who were post-natal with vaginal delivery, followed by six deaths during labor and one death occurred post-natal LSCS. No deaths were reported due complications related to abortion (Fig. 3).

It was also noted that ten out of 18 maternal deaths (55.5%) were related with hypertensive disorder of pregnancy that is changing trends in tertiary center from past, where most maternal deaths are due to obstetric hemorrhage and complications of abortion. Antepartum eclampsia was reported in seven maternal deaths, pregnancy-induced hypertension was responsible of deaths of three. Retained placenta, multi-organ failure due to hepatitis, and rupture uterus caused death of one female patient each. Severe anemia and septic shock caused deaths of three and two patients, respectively (Fig. 4).

DISCUSSION

The reproductive health of society can be indexed by maternal mortality. High incidences of maternal mortality reflect poor quality of maternal health care services and lack of healthcare for mothers.

In our study, the most significant maternal deaths (72%) happened in 18–25 years old. A similar survey by Tayade *et al.* (2012) reported the maximum number of maternal deaths in the 19–29 age group [9]. Our results were comparable to those reported by other studies that reported maximum maternal deaths in the 20–30 age group [15-17]. Early marriage and early pregnancies may be responsible for this distribution.

In our study, 10 (56%) women who died were multigravida, and 8 (44%) were multigravida. A study by Sanju Kumari *et al.*, Garg *et al.*, and Lamba *et al.* have also reported more deaths in multigravida women [11-13]. More deaths in multigravida or second pregnancy can be due to shorter time between pregnancies, and the health status of the female is not recovered completely. They are more prone to experience obstetric issues such as preeclampsia, eclampsia, anemia, sepsis, and irregular labor. As a result, patients must be informed about family planning options and fallacies about various forms of contraception,

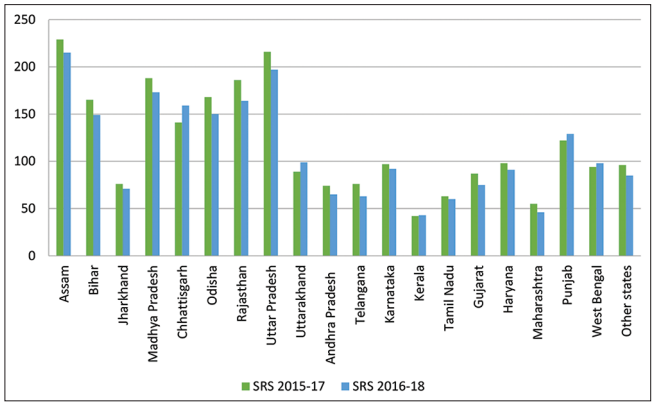

Fig. 1: Maternal Mortality in India (2015–2018) [10]

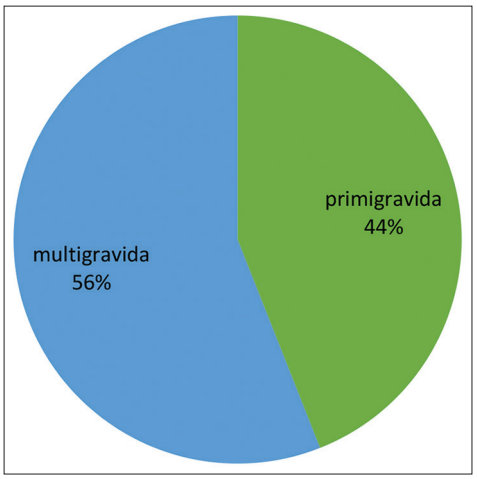

Fig. 2: Type of pregnancy

and the public must be made aware of the multiple dangers associated with increasing number of pregnancies. Maternal health is significantly impacted by family planning, by lowering the number of high-risk and high-parity deliveries, contraception reduces maternal mortality. In addition, having access to contraceptives helps prevent unintended pregnancies, some of which lead to unsafe abortions, which are one of the main causes of maternal death worldwide. It is evident in that if complications of PPH pre-eclampsia are present in the first or second pregnancy, then definitely, this is present in the subsequent pregnancy, so better they avoid pregnancy, or they should be in close contact with their obstetrician so if any problem occurred that should be resolved immediately, and further, complications should be avoidable [2,14].

This study also reported most deaths within just 12 h of hospitalization. Lamba *et al.* (2016), Priya *et al.* (2010), and Puri *et al.* (2011) also reported maximum deaths within 24 h of hospitalization. This reinstates that late referral is still one of the major causes of maternal deaths in India [13,18,19].

Hypertensive disorders were responsible for the death of 55.5% of women in our study, which aligns with Tayade *et al.* (2012), who reported 30% of deaths due to the same reason [20].

Among the indirect causes of maternal fatuity, anemia was the most common cause of death [3]. Tayade *et al.*, Bera *et al.* also reported 40% and 9.9% deaths by anemia, respectively [20,21]. MMR was found high (357) in study which is quite high than average for state 173/lac live births that this can be due to the fact that our institution is a tertiary care center, so sever and complicated cases referred from different primary and secondary care centers reach to the center.

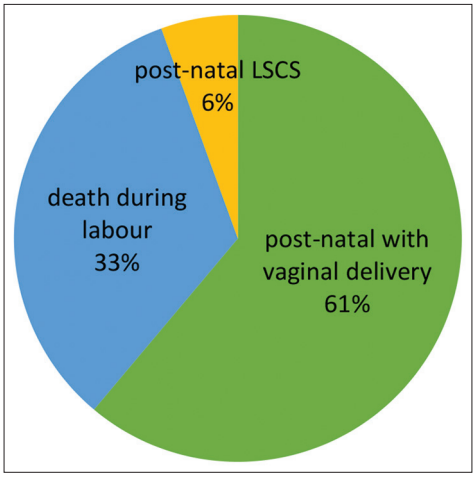

Fig. 3: Deaths during different stages of pregnancy

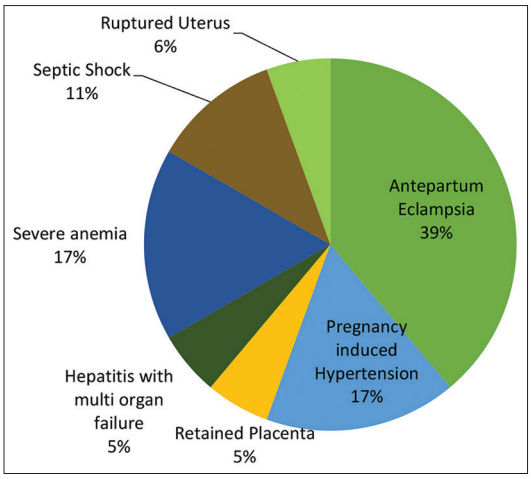

Fig. 4: Causes of maternal deaths

CONCLUSION

The primary cause of concern in our study is death due to hypertensive disorders of pregnancy. Late diagnosis and delayed referral cause multiorgan failure. These deaths are also preventable if we predict and catch them in the early stage. The social stigma of greediness for male babies is still prevalent in our society, so they become pregnant again and risk their own lives leading to maternal death. This message should be evident in the community that if complications of PPH pre-eclampsia are present in the first or second pregnancy, then definitely, this is present in the subsequent pregnancy, so better they avoid pregnancy, or they should be in close contact with their obstetrician so if any problem occurred that should be resolved immediately, and further, complications should be avoidable.

CONFLICTS OF INTEREST

The authors declare no conflict of interests.

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Nil.

REFERENCES

1. World Health Organization. International Classification of Diseases. Geneva: World Health Organization. Available from: https://www.who.int/classifications/icd/en
2. Thaker RV, Tyagi AA, Makwana NM, Patel FP. Prevalence and causes of maternal mortality at a tertiary care teaching hospital in Western India. Indian J Appl Basic Med Sci 2022;24:288-98.
3. World Health Organization. Strategies toward Ending Preventable Maternal Mortality (EPMM). Geneva, Switzerland: World Health Organization; 2015. Available from: https://www.who.int/reproductivehealth/topics/maternal_perinatal/epmm/en [Last accessed on 2020 Sep 24].
4. Jha P. Reliable direct measurement of causes of death in low-and middle-income countries. BMC Med 2014;12:19.
5. Gomes M, Begum R, Sati P, Dikshit R, Gupta PC, Kumar R, *et al*. Nationwide mortality studies to quantify causes of death: Relevant lessons from India's million death study. Health Aff (Milwood) 2017;36:1887-95.
6. Registrar General India. Centre for Global Health Research. Maternal Mortality in India: 1997-2003 Trends, Causes and Risk Factors. New Delhi, India: Registrar General India, Centre for Global Health Research; 2006.
7. World Health Organization. Health Topics, Maternal Health. Geneva: World Health Organization. Available from: https://www.who.int/topics/maternal_health/en [Last accessed on 2016 Jan 16].
8. World Health Organization. Maternal Mortality Ratio (per 100 000 Live Births). Geneva, Switzerland: World Health Organization; 2021. Available from: https://www.who.int/data/gho/indicator-metadataregistry/imr-details/26 [Last accessed on 2022 Apr].
9. Bhandari P. Refining State Level Comparisons in India; 2012. Available from: https://planningcommission.nic.in/reports/articles/article_state.pdf
10. Available from: https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1796436
11. Kumari S, Kapoor G, Sharma M, Bajaj B, Dewan R, Nath B. Study of maternal near miss and maternal mortality in a tertiary care hospital. J Clin Diagn Res 2020;14:4.
12. Garg P. To study maternal mortality and complications leading to maternal death in the tertiary care centre. Int J Med Res Rev 2016;4:347-52.
13. Lamba A, Agarwal S, Dutta AK. A cross sectional study to assess the pattern of maternal mortality in a tertiary level government hospital of a city in North India. Int J Reprod Contracept Obstet Gynecol 2016;5:220-4.
14. Family and Maternal Health. Available from: https://www.mhtf.org/topics/family-planningmaternal-health/#:~:text=In%202008%2C%20contraceptive%20use%20averted,births%2C%20thereby%20reducing%20maternal%20mortality
15. Aggrawal V. Study of maternal mortality. J Obstet Gynaecol India 1982;32:686-90.
16. Dogra P, Gupta K. A study of maternal mortality at a tertiary institute. Obs Gynae Today 2009;115:58-60.
17. Devinder K, Amrirpal K. A retrospective study of maternal mortality in government medical college. J Obstet Gynaecol Fam Welfare 1999;5:18-22.
18. Puri A, Yadav I, Jain N. Maternal mortality in an urban tertiary care hospital of North India. J Obstet Gynaecol India 2011;61:280-5.
19. Priya N, Verma A, Verma S. Maternal mortality: Ten years retrospective study. J K Sci 2010;12:134-6.
20. Tayade S, Bagde M, Shivkumar PV, Tayade A, Bagde N. Maternal death review to know the determinants of maternal mortality in a district hospital of central India. Int J Biomed Res 2012;3:157-63.
21. Bera SK, Sengupta A. Evaluation of etiological factors of maternal deaths in Eden hospital (twelve years study). J Obstet Gynaecol India 1991;41:208-12.