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Original Article

A STUDY OF MATERNAL MORTALITY IN A RURAL TERTIARY HOSPITAL OF WEST BENGAL

Banasree Bhadra[1], Dhrubajyoti Sarkar[2], Suvobrata Sarkar[3]

ABSTRACT

BACKGROUND: Maternal mortality actually reflects the quality of obstetric services given to pregnant women in any community.

Objectives of the study is to calculate the maternal mortality rate in a teaching institution, to assess the epidemiological aspects of maternal mortality and to assess the different causes of maternal mortality.

METHODS: This was a retrospective study where individual records of all maternal deaths occurring in our hospital during the past 2 years from 2020 to 2021 were studied. The cause of death which led to death in each individual case were analyzed.

RESULTS: A total of 44 maternal deaths occurred during the study period. The average maternal mortality ratio in the study period was 333.4/100000 live births. Most maternal deaths (38.6%) occurred in the age group of 25–29 years, multiparous women (63.6%) and 43.2% cases were referred cases. Direct causes accounted for 65.9% of maternal deaths where as 34% of maternal deaths were due to indirect causes. Haemorrhage (20.4%) and pre-eclampsia/eclampsia (18.1%) were the major direct causes of maternal deaths. Out of 44 maternal deaths, 43.2% were referred cases from health centres, district hospitals etc.

CONCLUSION: Early detection of high-risk pregnancies and early referral of such patients to a tertiary center can reduce the complications of high-risk pregnancies and subsequent deaths.

KEY WORDS: Maternal Mortality ratio, Maternal deaths, Haemorrhage, eclampsia.

INTRODUCTION

"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" (World Health Organization, WHO; ICD-10). The global maternal mortality ratio (MMR) was 210 maternal deaths per 100 000 live births in 2013, which had reduced down from 380 maternal deaths per 100 000 live births in 1990[1]. About 99% of these women are from developing world with over 85% concentrated in Africa and Asia[2]. About 295 000 women died

during and following pregnancy and childbirth in 2017. In India, Maternal Mortality Ratio has declined to 113 in 2016-18 from 122 in 2015-17 and 130 in 2014-2016.[3] United Nation (UN) report card on Millennium Development Goal-5 concluded that little progress had been made in sub-Saharan Africa where half of all maternal deaths take place. The progress shown by the South Asian countries including India which accounts for 25% of all maternal deaths is also not impressive[4].

Keeping these in mind this study was done in a tertiary medical college hospital situated in rural part of West Bengal to assess maternal mortality where large numbers of patients are referred from surrounding rural areas. This study also studies the causes of maternal mortality and suggest measures to reduce the same.

MATERIALS AND METHODS

AIMS AND OBJECTIVES

1. To calculate the maternal mortality rate in a teaching institution.
2. To assess the epidemiological aspects of maternal mortality.
3. To assess the different causes of maternal mortality.

Our hospital is a rural tertiary care center situated in West Bengal where a large number of patients are referred from Primary health centers, District hospitals and surrounding rural areas. The present study was 2 years retrospective study, conducted in the department of Obstetrics and Gynecology of this hospital. Data regarding maternal mortality was collected from maternal mortality Register from January 2020 to December 2021 with consent of hospital authority. The data of maternal deaths were collected and analyzed with a view to find out the avoidable risk factors. Direct causes of maternal death included haemorrhage, eclampsia / pregnancy induced hypertension (PIH), sepsis, ectopic pregnancy and other causes (rupture uterus, retained placenta, inversion of uterus etc.). Indirect causes included anaemia, jaundice, heart disease, respiratory and miscellaneous causes (fever, carcinoma of cervix/ovary with pregnancy, rupture of ovarian cyst with pregnancy, renal, central nervous system (CNS) causes, anaesthetic cause etc.).

RESULTS

During our study period, January 2020 to December 2021, there were 44 maternal deaths in total. In 2020 maternal deaths were 24 and maternal mortality ratio (MMR) was 344.1/1 lakh live births (6974 live births in 2020). In 2021, 20 maternal deaths were recorded with MMR 322.8/1 lakh live births (6195 live births in 2021). Average maternal mortality was found to be 333.4/ 1lakh live births in our study period. Maternal mortality was mostly seen among patients of 25 to 29 years (38.6%) as summarized in Table 1. More deaths were reported in multiparous women (63.6%). Out of 44 maternal deaths 43.2% were referred cases from health centres, district hospitals etc. (Table 1).

In the study period, direct causes contributed to 65.9% of the maternal deaths whereas indirect causes were 34%. The most common direct cause was hemorrhage (20.4%) considering ante partum, intra partum and postpartum deaths in the study period. Other important causes contributing to the mortality were pregnancy induced hypertension, (18.1%) and sepsis (15.1%). Among the indirect causes of maternal death respiratory causes in pregnancy (13.6%) and renal causes (4.5%) contributed more. The direct and indirect causes of death are summarized in Table 2 and 3 respectively. It was also observed in this study that maximum maternal deaths took place during immediate puerperal period. 4 (four) maternal deaths were during ante natal period while the other 40 mortalities were after delivery, mostly caesarean section.

DISCUSSION

Pregnancy is not a disease and childbirth are a universally celebrated event. Maternal mortality reflects the quality of obstetric services given to pregnant women in the community.

Increased coverage of skilled birth attendance and delivery in facilities properly resourced for emergency obstetric care is essential for prevention of the maternal deaths[1]. Between 2000

and 2017, South Asia achieved the greatest overall percentage reduction in MMR, with a reduction of 59 per cent (from 395 to 163 maternal deaths per 100,000 live births). Sub-Saharan Africa achieved a substantial reduction of 39 per cent of maternal mortality during this[5]. High incidence of maternal deaths reflects poor quality of maternal services, late referral and low socioeconomic status of the community[6].

The average maternal mortality rate in the study period was 333.4/100000 live births. The maternal mortality ratio (MMR) in India is 113/100,000 live births (SRS 2016-18). Various studies done in India in the last 15 years have shown wide variation in MMR ranging from 47/100000 to 625/100000 births[6,7,8,9,10]. Our study has comparatively high MMR, which could be due to the fact, that our hospital is a tertiary care hospital and receives a lot of complicated referrals from rural areas and often at a very late stage. In West Bengal MMR was 98/100,000 live births in 2016-18. But the maternal death varies in various districts of West Bengal from 31%-235%[11].

In our study, 54.5% of maternal deaths were in the age group of 20 to 29 years, as highest numbers of births are reported in this age group. This is concomitant with the prevailing custom of early marriage in rural areas[12].

63.8% of maternal deaths were reported in multiparous patients. Our findings were similar to studies by Murthy[6] and Jadhav[8]. 43.2% were referred cases in our study. In a similar study done by Jain et al in a tertiary care center in West Bengal 60% cases were found to be referred cases[13].

In our study, 65.9% of maternal deaths were due to direct causes. Hemorrhage (20.4%) and pre-eclampsia/eclampsia (18.1%) were the major direct causes of maternal deaths. Our findings were consistent with studies by Murthy[6], Jadhav [8], Onakewhor[10] and Shah[11]. In a systematic review by WHO, hemorrhage was the leading cause of maternal death in Africa and Asia 33.9% and 30.8%, respectively[14]. Similar findings were seen in the study by Jain et al in West Bengal[13]. Maternal death review meetings conducted monthly in the institution analyzed the cause of deaths and the steps needed to prevent such deaths. It was seen that many of these deaths were preventable if patients were given appropriate treatment at periphery and timely referral to higher centers was done. In many peripheral centers 24 hours caesarean section facility and blood bank facility is not available which lead to delay in-patient treatment. Delay in arrangement of transport of patient to our center and reluctance of patient attendants in giving consent for operation also added to the delay of treatment.

Training of medical officers, staff nurses and healthcare workers working in rural areas by programs like basic emergency obstetrics care (BEMOC) and skilled attendant at birth (SAB) training would perhaps reduce maternal mortality. Maternal deaths can be prevented by improving the health care facilities in rural areas by ensuring continuous 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 [6]. Blood banks should also be available in the rural health centers. Roads of rural areas should be well connected to the nearby towns. Proper reproductive health education and iron supplementation should be started in schools itself to reduce the incidence of anaemia.

Delivery in institutional facilities has risen from 26 percent in 1992-93 to 72 percent in 2009. Millennium Development Goal (MDG) was established in United Nations in 2000. One of the targets was to reduce MMR by three quarters (75%) between 1990 and 2015 and also to achieve, by 2015, universal access to reproductive health [14]. Since MDG could not be achieved new post 2015 target (sustainable development goal) has been set up. By 2030, all countries should reduce MMR by at least two thirds of their 2010 baseline level. The average global target is an MMR of less than 70/100 000 live births by 2030. The supplementary national target is that no country should have an MMR greater than 140/100 000 live births (a number twice the global target) by 2030[15].

Since good number of cases of maternal death is seen in referred cases with haemorrhage being the commonest case, proper antenatal care, awareness in the community, early detection of high-risk pregnancies and early referral of such patients to a tertiary center can reduce the complications and subsequent deaths.

Table 1. Demographic factors: Age, Parity of patients

Age of mother	Number of patients	Percentage
<20years	3	6.8%
20-24 years	7	15.9%
25-29 years	17	38.6%
30-34 years	8	18.1%
>35 Years	9	20.4%
Parity		
Primi	16	36.3%
Multi	28	63.6%
Referred / In patient		
Referred cases	19	43.2%
In patient	25	56.8%

Table 2. Direct Obstetric causes of mortality

Year	Total	Hemorrhage (APH/IPH/PPH)	Pregnancy induced Hypertension	Sepsis excluding abortive	Abortion / Ectopic
2020	18	6	3	4	5
2021	11	3	5	3	0
Total (%)	29(65.9%)	9(20.4%)	8 (18.1%)	7(15.9%)	5(11.36%)

Table 3 – Indirect obstetrics causes of mortality

Year	Total	Anemia	CVS	Liver	Resp	Renal	CNS	Others
2020	6	1	0	2	1	1	1	0
2021	9	1	1	1	5	1	0	0
Total	15(34%)	2 (4.5%)	1(2.27%)	3 (6.8%)	6 (13.6%)	2 (4.5%)	1(2.27%)	0

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1. Professor, Department of Obstetrics and Gynaecology, College of Medicine and JNM Hospital, WBUHS, Kalyani, Nadia, West Bengal
2. Professor, Department of Anesthesiology, College of Medicine and JNM Hospital, WBUHS, Kalyani, Nadia, West Bengal
3. Assistant professor, Department of Obstetrics and Gynaecology, College of Medicine and JNM Hospital, WBUHS, Kalyani, Nadia, West Bengal

✉ Email: banasree22@yahoo.com