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A descriptive study of maternal near miss cases in tertiary care center

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Abstract
Introduction: Maternal near miss (MNM) case is defined as "a woman who nearly died but survived a complication that occurred during pregnancy, childbirth, or within 42 days of termination of pregnancy. Maternal mortality is one of the important indicators used for the measurement of maternal health. Improvement of maternal health is one of the millennium development goals (MDG), MDG 5 with Target 5 A that calls for the reduction of maternal mortality ratio by three quarters between 1990 and 2015. **Materials and Methods:** The study was conducted in the Department of Obstetrics and Gynecology, Mahatma Gandhi Memorial Medical College and Hospital Jamshedpur, Jharkhand which is a tertiary care centre and serves as a referral centre for other Primary Health Centre and District hospitals of Jharkhand. Cases of severe obstetric morbidity were identified during daily morning meetings, where all the new admission in the last 24 hour and serious inpatient cases were discussed. All the cases were followed during their hospital stay till their discharge or death. **Results:** During the 12 months of the study period, 10000 deliveries at the institution and 240 women were identified as near-miss obstetrical cases by five factor scoring system. The prevalence of near-miss case in this study was 2.4%. Near-miss per 1000 delivery was 24%. Maternal death to near miss ratio was 1:7.2. The leading causes of maternal near miss were hemorrhage (42.5%) and hypertensive disorder of pregnancy (23.5%) The morbidity was high in unbooked cases. **Conclusion:** Lesson can be learned from cases of near-miss which can serve as a useful tool in reducing maternal mortality ratio. Need for development of an effective audit system for maternal care which includes both near-miss obstetric morbidity and mortality is felt.
Keywords: Maternal near miss, Maternal mortality, hypertensive disorder of pregnancy.

Introduction

Maternal near miss (MNM) case is defined as "a woman who nearly died but survived a complication that occurred during pregnancy, childbirth, or within 42 days of termination of pregnancy [1].

Maternal mortality is one of the important indicators used for the measurement of maternal health. Improvement of maternal health is one of the millennium development goals (MDG), MDG 5 with Target 5 A that calls for the reduction of maternal mortality ratio by three quarters between 1990 and 2015[2].Maternal mortality is frequently described as "just the tip of the iceberg" indicating that there is a vast base to the iceberg in the form of MNM, i.e., maternal morbidity which has remained largely undescribed.[3]Near miss audit has been considered a better approach than maternal death audit, and can be used to identify what need to be done to improve the quality of maternal health care[4]. Compared with maternal death review, the fear of blame and punishment is less in near miss review, so, if a near miss review is performed effectively, it can in practice more easily lead to implementation of changes that will improve the quality of services. Near miss cases generally occur more frequently than maternal deaths and therefore a more reliable quantitative analysis can be carried out, which can provide a more comprehensive profile of health system functioning[5].

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Identification of the obstacles and gaps in the health system and a co-ordinated approach to resolve these can ultimately lead to an improved health system. Near miss cases have similar pathways as maternal deaths, with the advantages of offering a larger number of cases for analysis, greater acceptability of individuals and institutions since death did not occur, and the possibility of interviewing the woman herself [6].The most vital purpose of the near miss approach is to improve clinical practice and reduce preventable morbidity and mortality through the use of best evidence-based practices.

Materials and methods

Study Design

A descriptive study

Study location

Department of Obstetrics and Gynecology, Mahatma Gandhi Memorial Medical College and Hospital Jamshedpur, Jharkhand
The study was conducted in the Department of Obstetrics and Gynecology, Mahatma Gandhi Memorial Medical College and Hospital Jamshedpur, Jharkhand which is a tertiary care centre and serves as a referral centre for other Primary Health Centre and District hospitals of Jharkhand.This was a descriptive study done for the period of 12 months between March 2020 to March 2021. Cases of severe obstetric morbidity were identified during daily morning meetings, where all the new admission in the last 24 hour and serious inpatient cases were discussed. All the cases were followed during their hospital stay till their discharge or death. Five factor scoring system was used to identify the near miss cases from all the severe obstetric morbidity. For each case of near miss, data were collected on demographic characteristics including gestational age at the time of sustaining the near-miss morbidity, nature of obstetric complications, presence of organ-system dysfunction/failure, ICU admission and timing of near-miss event with respect to admission. Information during the study period was obtained from labour room and ICU/HDU registers.

Topno and Srivastava   International Journal of Health and Clinical Research, 2021; 4(16):197-199
www.ijhcr.com
197

Data were entered into a computer database using Microsoft Excel spreadsheet and statistical analysis was performed. The prevalence of near-miss cases is defined as the numbers of near-miss cases divided by the number of deliveries in the hospital.

Results

During the twenty-four months of the study period, 10000 deliveries at the institution and 240 women were identified as near-miss obstetrical cases by five factor scoring system. The prevalence of near-miss case in this study was 2.4%.

Table 1: Patient demographic characteristics

Parity	Near miss cases 240
0	69 (28.75%)
1-2	125 (52.08%)
3-4	15 (6.25%)
Booking status	
Unbooked at MGM, Jamshedpur	192 (80%)
Gestational age (week)	
<13	40 (16.6%)
13-28	18 (7.5%)
>28+postpartum	101 + 81 (75.8%)

Table 2: Frequency and characteristics of near-miss cases

S.No	Deliveries	10000
1	Live Birth	9213
2	Near miss	240
3	Referred from other PHCs	144 (40%)
4	On arrival	125 (52.08%)
5	During Hospitalization	115 (47.9%)

The demographic characteristics of the women classified as near-miss was median age- 14 (18-35), 69 (28.7%) women were nulliparous. Majority of them were pare 1-2. 80% of the cases of near-miss were unbooked at MGM, Jamshedpur. Prevalence of near-miss was highest in third trimester and postpartum period and was less in second trimester. 40% of the cases were referred from other hospitals in a critical care for ICU/HDU care. 52% of the cases were critical on arrival to hospital. Near-miss per 1000 delivery was 24%. maternal death to near miss ratio was 1:7.2.

Table 3: Diagnostic distributions of near-miss cases

Disease	Near miss (n)
Haemorrhage	**102**
Early pregnancy	
Ectopic	**10**
Abortion	**13**
Late pregnancy	
Rupture uterus	31
Placenta previa	14
PPH	34
Hypertension	72
Eclampsia	40
Severe preeclampsia	31
Infections	24
Others anaesthetic complication	7
Cardiomyopathy	2
Organ system failure	33

102 cases of near miss were due to haemorrhage (42.5%) of which 631 cases were due to rupture uterus. 14 cases were due to placenta previa, placenta accreta. Other cases were due to PPH out of which 5 cases were due to severe secondary PPH following caesarean delivery for which hysterectomy was required. Hypertensive disorder of pregnancy was another important condition and accounted for 23.5% of cases. Cases of eclampsia received magnesium sulphate as anticonvulsant and were monitored in ICU. 24 cases were complications of septicaemia leading to multi organ failure 10 cases were due to cardiac failure out of which 2 cases were due to postpartum cardiomyopathy. Regarding the presence of different factors according to five factor scoring system, ICU admission was the most common factor followed closely by organ system failure. Total 33 cases suffered from organ system failure of which 4 cases had more than one organ/ system failure.

Discussion

Near miss criteria were in vogue for some years, yet lack of uniformity was the hindrance. WHO criteria 2009 considered clinical as well as laboratory and management based criteria. Hence it incorporates both Mantel's and Waterston's criteria. The near miss rate was 2.4% in this study as against 4.4 per 1000 live births in a study from Brazil which used the new WHO criteria in an intensive care unit and MNMIR from India is reported to be 17.8/1000 live births[7]. The maternal near miss incidence ratio is 24 per 1000 live births in this study, which is comparable to other studies done in developing countries show the same trend and vary between 15 to 40 per 1000 live births. The near miss to mortality ratio in our study is 7.2:1 which means for every 7.2 near miss cases, there was one maternal death. Higher ratios indicate better care. Syrian study showed 60:1 and study in Nepal showed a ratio of 7.2:1[8].

In another study conducted in Kathmandu by Shrestha et al, it was observed that pregnant women with gestational age of <13, 13-28, >28 weeks and postpartum period who belonged to 'near miss's category were 11 (30.5%), 6 (16.66%), 10 (27.77%) and 9 (25%) women respectively; A comparable study by Ranatunga et al from Srilanka found that majority (57.1%) of 'near miss' cases were gravida G2-G4. Nelissen et al from Tanzania and Shreshta et al from Nepal also showed similar findings. However, Roopa et al showed in

their study from South India that 56. % of the 'near miss' cases were of gravid status G1. Maternal mortality rate was an important indicator of the health care system[9].

As the rate declined in developed countries maternal near miss was considered and guidelines to select a patient under this category were given by WHO working group in due course assessment of health care facilities by maternal near miss was found to be equally effective Since then focus was shifted from maternal mortality to maternal near miss. Pacagnella RC, Cecatti JG et al found the incidence of potentially life threatening maternal conditions to be 11.6%. A similar study done by Roopa PS, Shailja Verma et al found 10.3% incidence of potentially life threatening maternal condition. Maternal near miss incidence ratio has been 9.2 per 1000 live births. A study by Jayarathnam[10].

Conclusion

Lesson can be learned from cases of near-miss which can serve as a useful tool in reducing maternal mortality ratio. Need for development of an effective audit system for maternal care which includes both near-miss obstetric morbidity and mortality is felt.

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Topno and Srivastava   International Journal of Health and Clinical Research, 2021; 4(16):197-199
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199