

Clinical and Etiological Study of Maternal Near-Miss at a Tertiary Referral Hospital of Central India

Jyoti Bindal^{1,*}, Garima Solanki²

¹Proff & Head, ²Ex Resident, Dept. of Obstetrics & Gynecology, G R Medical College, Gwalior.

***Corresponding Author:**

E-mail: drjyotibindal@bindal.me

Abstract

Background: Analyzing the maternal near miss provides a good opportunity for assessing the factors responsible for maternal mortality in that area.

Objective: To study the clinicoetiological profile of severe maternal morbidity/near misses in a tertiary public maternity using WHO identification criteria.

Material and Methods: A prospective observational study included patients admitted to Obstetrical ICU of Kamla Raja Hospital, G R Medical College, Gwalior between April 2014 and October 2014. The patients who fulfilled the WHO criteria of maternal near miss were enrolled; their clinical and investigation parameters were recorded.

Results: Out of 4481 deliveries, 168 (3.74%) were near-miss cases. The mean age of the near-miss patients (168) was 28 ± 3.11 years. Near-miss incidence ratio was 37.65 per 1000 live birth. Most of the patients of near-miss were of multipara (71.42%). The majority of the patients were unbooked (65.24%). The major causes of near miss were hypertensive disorders (44.04%), severe hemorrhage (26.19%) and severe anemia (10.71%).

Discussion: The study of maternal near miss provides an insight into the causes of maternal mortality in this region. The maternal morbidity and mortality can be reduced by providing proper antenatal care at primary and community health centre level and good intensive care at tertiary level.

Key words: Near-miss, Maternal mortality, Maternal death

Access this article online	
Quick Response Code: 	Website: www.innovativepublication.com
	DOI: 10.5958/2394-2754.2016.00006.0

Introduction

Maternal mortality remains a major public health problem in low income and middle income countries. The maternal mortality ratio (MMR) of India was 254 (2004-2006), which in 2010 was reduced to 200, and target under Millennium Development Goal is to achieve 100 by 2015.¹

Women who develop severe acute maternal morbidity (SAMM) during pregnancy share many pathological and circumstantial factors related to their condition. Although some of these women die, a proportion of them narrowly escape death. Near miss cases and maternal deaths together are referred to as severe maternal outcome (SMO).²

The concept of "maternal near-miss," has evolved during the past 2 decades which means very severe maternal morbidity.³ A WHO Working Group in 2009, defined maternal near-miss morbidity as "a woman who nearly died but survived a complication that occurred during pregnancy, childbirth, or within 42 days of termination of pregnancy".⁴

Maternal near miss cases are more common than maternal deaths and analyzing these cases has now become a useful approach for designing the strategies to improve the maternal care. Using the disease specific criteria the prevalence of near miss has been reported to be between 0.80% and 8.23%.⁵

The present study was done to find out the incidence of near miss and its determinant factors in patients reaching the biggest tertiary care hospital of Gwalior Chambal region.

Materials and Methods

This observational prospective study was done for 6 month at the Kamla Raja Hospital, G R Medical College, Gwalior; included the patients admitted between April 2014 and October 2014. All patients who fell under near miss criteria according to WHO were included in the study (table 1).

Detailed history of patients like name, age of patients, date of admission and death and presenting complaints was recorded. Obstetrics history including history of previous pregnancy and labour, complication during present pregnancy, past and present medical problems were also recorded.

A written informed consent from all the patients and Institutional Ethics Committee was taken before starting the present study.

Statistical analysis was done for calculating mean \pm SD and other parameters using SPSS ver. 20. P value of <0.05 was considered to be significant in present study.

Table 1: Maternal near-miss terminology⁶

Code	Category	Definition
1	Major obstetric hemorrhage	Estimated blood loss of >2500 ml or transfused 5 or more units of blood or received treatment for coagulopathy
2	Eclampsia	Seizure in presence of preeclampsia
3	Renal or liver dysfunction	Acute onset of biochemical disturbance, urea >15 mmol/L, creatinine > 400 mmol/L, AST/ALT >200 µ/l
4	Cardiac arrest	No detectable major pulse
5	Pulmonary edema	Clinically diagnosed pulmonary edema associated with acute breathlessness and O ₂ saturation < 95%, requiring O ₂ , diuretics or ventilation
6	Acute respiratory dysfunction	Requiring intubation or ventilation for > 60 min
7	Coma	Including diabetic coma, unconscious for 12 hours
8	Cerebrovascular events	Stroke, cerebral/cerebellar hemorrhage or infarction, subarachnoid hemorrhage, dural venous sinus thrombosis
9	Status epilepticus	Unremitting seizures in patients with known epilepsy.
10	Anaphylactic shock	An allergic reaction resulting in collapse with severe hypotension, default in breathing and swelling/ rash
11	Anesthetic problem	Shock in association with infection, no other cause for decreased blood pressure, Pulse of 120bpm or more
12	Anesthetic problem	Aspiration, failed intubation, high spinal or epidural anesthetic.
13	Massive pulmonary embolism	Increased respiratory rate, tachycardia, hypotension, diagnosed as high probability V/Q scan, Positive spiral chest CT scan, treated by heparin, thrombolysis or embolectomy.
14	Intensive care admission, coronary care admission	Unit equipped with all instrument to ventilate adults, admission for one of the above problems for any other reason, Includes CCU admission.

Results

During the study period a total 4481 deliveries were observed, out of that 168 (3.75%) were near-miss cases. There were 4462 (99.57%) live births and 31 (0.69%) maternal deaths.

Out of 168 near-miss cases, most of them [112 (66.66%)] belong to age group of 21-30 years, followed by 32 (19.05%) of age more than 30 years and only 24 (14.28%) were of age less than 20 years.

Table 2: Distribution of causes of Near-miss Events

Diagnosis	Near-miss	MNM Incidence ratio/1000 LB	MNM: 1 MD
Hypertensive disorders (74)		16.58	14
Severe preeclampsia	19	4.25	3
Eclampsia	51	11.42	10
HELLP	04	0.89	1
Severe hemorrhage	44	9.86	6
Early pregnancy (8)			
Ectopic	06	1.34	1
Abortion	02	0.44	0
Late pregnancy (86)			
APH	16	3.58	1
PPH	20	4.48	4
Severe anemia	18	4.03	3
Sepsis	06	1.34	1
Indirect causes	26	5.82	7

APH; antepartum haemorrhage, PPH; postpartum hemorrhage, MNM: 1 MD; Maternal near-miss mortality ratio. Maternal near-miss mortality ratio (MNM: 1 MD) refers to the ratio between maternal near-miss cases and maternal deaths. Higher ratios indicate better care.⁷ MNM Ratio (MNMR) refers to the number of maternal near-miss cases per 1000 live births (MNMR + MNM/LB). Similar to the SMOR, this indicator gives an estimation of the amount of care and resources that would be needed in an area or facility.⁷

The mean age of the near-miss patients was 28 ± 3.11 years, while that of mortality group was 31 ± 2.44 years. Majority of the patients were unbooked (65.24%) in both near-miss and maternal deaths group.

Present study revealed maternal near-miss incidence ratio of 37.65 per 1000 live birth (LB), MMR of 694 per lakh LB and maternal death to near-miss ratio of 1: 5.4. Most of the patients of near-miss were of multipara [120 (71.42%)] followed by primipara in 48 (28.57%) patients. The distribution of causes of near-miss events is shown in table 2. Out of 168 near-miss cases, 116 (69/05%) were managed by surgical intervention. Caesarian section was done in 96 (57.14%), hysterectomy in 12 (7.14%) patients and laparotomy was required in 4 (2.38%) patients.

Discussion

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. Identification of the obstacles and gaps in the health system and a coordinated approach to resolve these can ultimately lead to an improved health system. Different studies from India and other developing and developed countries have reported prevalence of near-miss of 8.2%, 10.1% and 14.1% respectively.²

The high maternal near-miss ratio observed in the present study indicates the frequent occurrence of near-miss in this population. As this is a tertiary referral center which receives critical patients from all surrounding districts.

The major causes of potentially life-threatening conditions and near-miss cases were hypertension (44.04%) and obstetric hemorrhage (26.19%), findings that are comparable to those of other studies in low-resource countries.^{2, 8} Severe preeclampsia was the main diagnosis associated with near miss, coinciding with the findings Brazilian study.⁹ However; this finding differs from the studies conducted in developed countries where hemorrhage is ranked first.¹⁰

Sepsis occurred in 3.5% of patients, but in another study, this result was 23.7%.¹¹ Although the sepsis is not one of the most frequent complications, many studies consider it to have a higher mortality rate (7.4%), surpassing hemorrhagic (2.8%) and hypertensive (0.4%) disorders.¹² Analysis of causes of near-miss events showed that in 74 (44.05%) patients hypertensive disorders were responsible for near-miss and mortality. Tunçalp O et al in 2013 have also reported hypertension to be the most common cause of near-miss cases.¹³ An Indian Study done by Kalra et al in Rajasthan reported hemorrhage accounting for 56% cases (28.5% was due to postpartum and remaining were due to antepartum hemorrhage) and second leading cause was hypertension in form of eclampsia and preeclampsia accounting for 20 (17.8%) near-miss cases.⁸

Our is a tertiary referral centre covering 10 districts of Gwalior Chambal region, which deals with major percentage of near miss cases referred from these places.

The present study found an incidence of severe maternal morbidity/ maternal near- miss 37.56 per 1000 LB. These data are consistency with those reported in the previous studies done at different places.⁸

MNM incidence ratio in our study was 37.56/1000 live births, comparable to studies done in developing countries. Same trend varies between 15-40/1000 LB's.⁷

In present study we found that evaluating the disease process at an early stage and then early referral from the primary health care level is of utmost important to save life of both the baby and mother. In addition, given the high occurrence of pre-eclampsia within the study population, management indicators specific to this condition might be integrated.

Conclusion

The major causes of near-miss cases were similar to the causes of maternal mortality of India. Lessons can be learned from cases of near-miss, which can serve as a useful tool in reducing MMR. Need for development of an effective audit system for both near-miss morbidity and mortality is felt.

Conflict of Interest: None

Source of Support: Nil

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