

A Study of Maternal Near Miss Events in A Tertiary Care Centre

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Introduction

World Health Organization (WHO) defines the criterion of severe maternal morbidity or Maternal Near Miss (MNM) as a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within six weeks after pregnancy¹.

Maternal mortality (MM) has been a very important maternal health indicator although it is frequently described as ‘just the tip of the iceberg’²

Resource constraints like non-availability of blood and blood products, rapidly developing antibiotic resistant bacterial strains; cases become critical. Traffic congestion, unorganised referral systems cause delay in transfer.³⁻⁴

In India MMR falls well short of the standards needed to achieve the Sustainable Development Goals (SDGs) that countries work together to achieve. In SDG 3, the MMR has to be reduced up to 70 per 100000 live births. Many Indian states have already achieved it, but the majority is still far from it⁷

Severe acute maternal morbidity (SAMM) is a life-threatening disorder that can end up in near miss with or without residual morbidity or mortality. Near-miss cases and maternal deaths (MDs) together are referred to as severe maternal outcome (SMO)⁶

SAMM is superior to mortality indicators in giving attention to surviving women’s reproductive health and lives, and can be used in developed as well as developing countries.⁵

Assessing deficiencies and gaps between actual use and optimal use of high priority interventions in prevention and management of severe pregnancy complications is essential.

All over the world, there is a gradual decrease in the maternal mortality ratio (MMR), and it decreased by 38% from 342 in the year 2000 to 211 in the year 2017 per 100,000 live births¹⁰

Maternal near miss mortality ratio: Higher ratio indicates better care.

Criteria for Identification

WHO recommended 3 approaches:

1. Disease specific criteria
 - Severe pre eclampsia/eclampsia
 - Severe hemorrhage
 - Severe sepsis
 - Uterine rupture
2. Management/Intervention based
 - Admission to ICU
 - Obstetric hysterectomy
 - Massive blood transfusion
 - Intubation/ Ventilation
3. Organ dysfunction based criteria
 - Based on Apparent clinical diseases
 - Clinical markers
 - Management needs

Materials and Methods

It was a retrospective observational study at a tertiary care centre, which included women according to the WHO near miss criteria over 1 year. All details were recorded by studying the case sheets of the patients.

Each case was documented with respect to the adverse event, the disorder and organ dysfunction.

Patient characteristics including age, parity, gestational age, whether came directly or referred from outside hospital, maternal near miss on arrival or became so later on, history of LSCS, adverse events, disorders, organ dysfunction, surgical intervention, need for admission to ICU, need for blood and blood products, risk factors, mode of delivery, lifesaving intervention were studied.

Patients who survived were included in this study as maternal near miss.

Exclusion criteria

Women that developed the above conditions unrelated to pregnancy

Statistical Analysis

After data collection, data entry was done in Excel. Data analysis was done with the help of SPSS Software version 21. Qualitative data like Gravida Para Status and symptoms treatment given, level of delay, referral causes etc. are presented with the help of Frequency and Percentage table and presented with pie chart and bar diagrams.

Results

The study was conducted on patients admitted between august 2022 to august 2023.

- Most of the cases were near miss on arrival and referred from outside.
- A total of 62 near miss cases and 11 maternal deaths were found during study period.
- The maternal near miss incidence ratio was 19.7 per 1000 live births, maternal near miss to mortality ratio was 5.6:1.
- Hypertension and its associated complications were the most common causes of maternal near miss followed by ruptured ectopic pregnancy.

Table 1: Age distribution of study population

Age group	N	%
18-24	30	48%
>25	32	52%

Table 2: Parity distribution of maternal near miss cases

Parity	N	%
Primi	24	39
Multi	38	61

Table 3: Mode of Delivery

Mode Of Delivery	N	%
Vaginal	12	27
LSCS	31	73

Table 4: Distribution of Underlying Factors Contributing To Maternal Near Miss

Other Underlying Factors	N	%
Lack Of Awareness	47	75.80
Lack Of Transport	10	16.12
Delay In Referral	5	8.06

Table 5: Causes Of Maternal Near Miss

Causes of MNM	N	%
Hypertensive Disorders of Pregnancy	34	54.83
Haemorrhage	20	32.25
Sepsis	1	1.6
Renal Dysfunction	1	1.6
Cardiac Disease	5	8.06
Aflp	1	1.6

Graph 1:

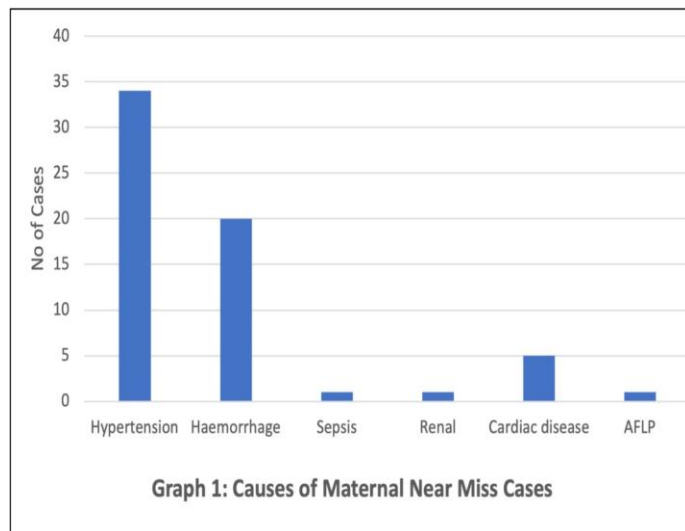


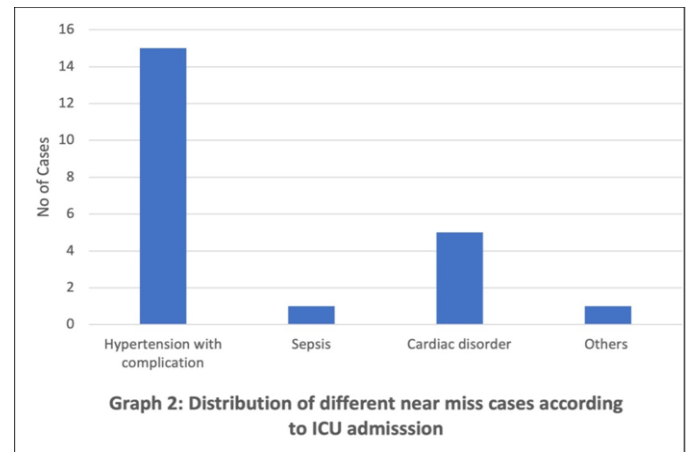
Table 6: Preexisting Disorders Aggravated During Pregnancy

Preexisting Disorder	N	%
Anaemia	22	35
Cardiac Dysfunction	3	4.8
Respiratory	1	1.6

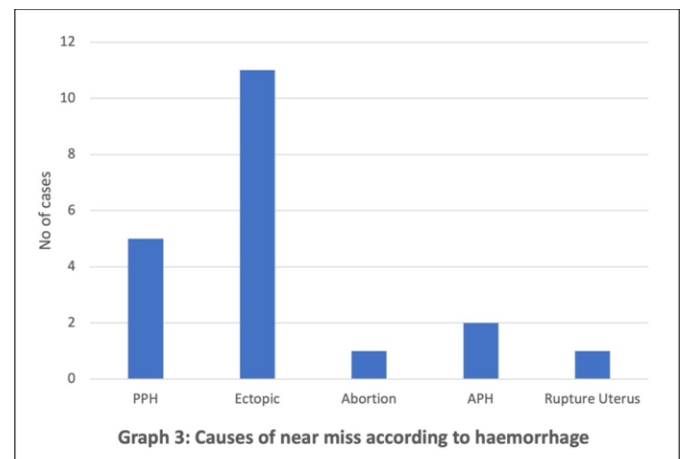
Table 7: Life Saving Interventions

Life Saving Intervention	N	%
Blood Transfusion	38	61.2
Peripartum Hysterectomy	9	14.5
Intubation	9	14.5
Ionotropes Support	5	8.06
Emergency Laprotomy	17	27.4

Graph 2:



Graph 3:



Discussion

This journal paper presents a comprehensive analysis of maternal near miss (MNM) incidence, mortality ratios, and contributing factors based on a study conducted on a sample of live births. The maternal near miss incidence ratio was determined to be 19.7 per 1000 live births, with a maternal near miss to mortality ratio of 5.6:1.

These findings closely align with the observations of Sunanda et al⁹. who reported a ratio of 18.76 per 1000 live births and a near miss to mortality ratio of 6.8:1. Notably, our study revealed a higher MNM ratio compared to Vandana et al⁸. where the MNM ratio was 11.58 per 1000 live births, and the maternal near miss to mortality ratio was 2.5:1 and Verma et al who reported a maternal near miss incidence of 12 per 1000 live births

- Hypertension and its complications emerged as the predominant cause of maternal near miss in our study, mirroring the findings of Sunanda et al⁹ and Verma et al¹⁵. In contrast, Vandana et al. identified obstetric hemorrhage as the most common cause. a. Rulisa et al. showed that the most common cause of MNM was peritonitis, hypertensive disorder in pregnancy, and hemorrhagic diseases¹⁶ Pre-existing anemia was identified as the most prevalent pre-existing condition contributing to maternal near miss cases⁸.
- Our analysis underscores the significance of factors such as inappropriate antenatal care, late identification, and insufficient intervention in high-risk pregnancies as crucial contributors to maternal near miss cases. Addressing these factors is imperative for improving maternal outcomes and reducing the incidence of maternal near miss in diverse healthcare settings.

Conclusion

Hypertensive disorders in pregnancy and obstetric hemorrhage are the leading cause of pregnancy specific obstetric disorders. The study identified that women who lack antenatal care, with irregular ANC visits, pre existing maternal chronic medical disorders and the first delay of obstetric care are at an increased risk of near miss cases.

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