VOLUME - 15, ISSUE - 04, APRIL - 2026 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper | Obstetrics & Gynaecology

ANALYSIS OF MATERNAL NEAR MISS CASES AT A TERTIARY REFERRAL CENTER IN GUJARAT: A PROSPECTIVE OBSERVATIONAL STUDY

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ABSTRACT

Background: Maternal near miss (MNM) is a key indicator of the quality of obstetric care, representing women who survive life-threatening complications during pregnancy or childbirth. Evaluation of MNM cases provides critical insights into gaps in healthcare delivery systems. **Objective:** To determine the incidence, causes, and outcomes of maternal near-miss cases at a tertiary referral center in Gujarat. **Methods:** A prospective observational study was conducted over one year (January–December 2023) in a tertiary care hospital. A total of 100 MNM cases were identified using World Health Organization criteria. Data on demographic characteristics, clinical presentation, underlying causes, interventions, and outcomes were systematically analyzed. **Results:** Among 8953 deliveries and 8605 live births, 100 MNM cases and 22 maternal deaths were recorded. The MNM incidence ratio was 11.62 per 1000 live births, with a near miss to mortality ratio of 4.54:1 and a mortality index of 0.18. A significant proportion (71%) of cases were near miss on arrival, highlighting delays in referral and access to care. Hypertensive disorders (40%) and obstetric hemorrhage (37%) were the leading causes. More than half (55%) required surgical intervention, while 66% resulted in live births. **Conclusion:** MNM is a sensitive indicator of maternal healthcare quality. Strengthening antenatal services, early risk identification, and efficient referral systems are crucial to reducing severe maternal morbidity and improving outcomes.

KEYWORDS : Maternal Near Miss, Severe Maternal Morbidity, Hypertensive Disorders, Obstetric Hemorrhage, Maternal Mortality, Tertiary Care, WHO Criteria

INTRODUCTION

"Women are not dying of diseases we cannot treat. They are dying because societies are yet to make the decision that their lives are worth saving.

— Mahmoud Fathalla, WHO

In healthcare literature, a near miss refers to a severe, life-threatening condition that did not result in death but had the potential to do so. It describes a situation in which a woman would have died if not for the timely and appropriate medical care she received.[1]

The study of near-miss cases provides valuable insights into disease burden and helps evaluate the quality of maternal healthcare services. While maternal death audits are crucial, especially in regions with high maternal mortality, they are often insufficient because many deaths occur in critically ill patients arriving late to healthcare facilities.[2]

Maternal near-miss (MNM), also referred to as severe acute maternal morbidity (SAMM), involves women who survive life-threatening complications during pregnancy, childbirth, or within 42 days of termination of pregnancy, excluding accidental or incidental causes.[3] Reviewing such cases through near-miss audits (NMA) helps identify gaps in care and areas requiring improvement.

Compared to maternal mortality, MNM cases are more frequent, allowing for better data analysis. Furthermore, survivors can provide direct insights into delays and deficiencies in care. These audits are more acceptable socially and institutionally and provide actionable information for policymakers and healthcare providers.[4]

Objective

To analyze maternal near-miss morbidity at Civil Hospital Ahmedabad a tertiary referral center in Gujarat and identify factors contributing to severe maternal outcomes.

Who Criteria For Maternal Near Miss (2011)

Table 1

Cardiovascular Dysfunction
- Shock
- Cardiac arrest
- Severe hypoperfusion (lactate >5 mmol/L)
- Severe acidosis (pH <7.1)
- Use of vasoactive drugs
- Cardiopulmonary resuscitation

Respiratory Dysfunction
- Acute cyanosis
- Gasping
- Severe tachypnea (>40/min)
- Severe bradypnea (<6/min)
- Severe hypoxemia (O_2 saturation <90% ≥60 min)
- Intubation and ventilation (non-anesthetic)

Renal Dysfunction
- Oliguria unresponsive to treatment
- Creatinine >3.5 mg/dL
- Dialysis

Coagulation dysfunction
- Failure to form clots
- Platelets <50,000
- Massive transfusion (≥5 units)

Hepatic Dysfunction
- Jaundice with preeclampsia
- Bilirubin >6 mg/dL

Neurological Dysfunction
- Coma (>12 hours)
- Stroke
- Status epilepticus
- Paralysis

Uterine Dysfunction
- Hysterectomy due to hemorrhage or infection

MATERIALS AND METHODS

This prospective observational study was conducted from January 2023 to December 2023 in the Department of Obstetrics and Gynaecology, Civil Hospital, Ahmedabad.

Study Population

Critically ill pregnant, laboring, postpartum, and post-abortion women admitted to the obstetric ICU/HDU.

Inclusion Criteria
- Women with life-threatening pregnancy-related complications
- Cases fulfilling WHO maternal near-miss criteria

Exclusion Criteria
- Accidental/incidental causes
- Patients leaving against medical advice
- Refusal of treatment
- Maternal deaths

RESULTS

A total of 100 maternal near-miss cases were identified among 8953 deliveries and 8605 live births, with 22 maternal deaths recorded.

Table 2: Census During Study Period

Parameter	Value
Total deliveries	8953
Total live births	8605
Near-miss cases	100
Maternal deaths	22
Women with life-threatening conditions	122
MNM incidence ratio	11.62 per 1000 LB
MNM:MD ratio	4.54:1
Mortality index	0.18

Table 3: Age Distribution (N=100)

Age Group	Number	Percentage
≤25 years	43	43%
26–30 years	25	25%
31–35 years	27	27%
36–40 years	5	5%

Table 4: Booking Status

Status	Number	Percentage
Unbooked	66	66%
1–2 ANC visits	22	22%
Regular ANC	12	12%

Table 5: Near-Miss Status

Status	Number
On arrival	71
After admission	29

Table 6: ICU Admission Indications (N=87)

Indication	Number	Percentage
Circulatory collapse	28	32.18%
Neurological dysfunction	15	17.24%
Respiratory dysfunction	14	16.09%
Monitoring	30	34.48%

Table 7: Mode of Delivery

Mode	Number	Percentage
Caesarean section	48	48%
Vaginal delivery	41	41%
Hysterotomy	2	2%
Abortion	4	4%
Ectopic pregnancy	5	5%

Table 8: Fetal Outcome

Outcome	Number
Alive	66
Dead (IUD/stillbirth)	25
Abortus	4
Ectopic	5

Table 9: ICU Stay Duration

Duration	Number
≤3 days	28
4–7 days	54
>7 days	18

Table 10: Hospital Stay

Duration	Number
<7 days	19
7–14 days	71
>14 days	10

Table 11: Classification of MNM

Category	Number
Pregnancy-specific	92
Pregnancy-aggravated	6
Incidental	2

DISCUSSION

The MNM incidence ratio in this study was 11.62 per 1000 live births, comparable to other Indian studies. The MNM-to-mortality ratio was 4.54:1, indicating moderate quality of care.

A majority (71%) of cases were near-miss on arrival, reflecting delays in seeking and accessing care. These delays include lack of awareness, transportation barriers, and deficiencies in peripheral healthcare systems.

Hypertensive disorders (40%) and hemorrhage (37%) were the leading causes of MNM, consistent with global trends.

Risk Factors Identified Included:

- Extremes of maternal age
- High parity
- Previous caesarean section
- Anemia
- Hypertension and diabetes

Limitations

The study duration was limited to one year. A longer study period would provide better insights into trends and effectiveness of interventions.

CONCLUSION

- Most MNM cases were present on arrival, indicating significant prehospital delays
- Hypertensive disorders and hemorrhage remain leading causes
- MNM incidence ratio was comparable to other developing regions
- MNM analysis is a valuable tool for improving maternal healthcare quality
- Strengthening antenatal care and referral systems is essential

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